

NOTICES OF FINAL RULEMAKING

The Administrative Procedure Act requires the publication of the final rules of the state's agencies. Final rules are those which have appeared in the *Register* first as proposed rules and have been through the formal rulemaking process including approval by the Governor's Regulatory Review Council or the Attorney General. The Secretary of State shall publish the notice along with the Preamble and the full text in the next available issue of the *Register* after the final rules have been submitted for filing and publication.

NOTICE OF FINAL RULEMAKING

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 23. BOARD OF PHARMACY

PREAMBLE

1. Sections Affected

R4-23-110
R4-23-404
R4-23-405
R4-23-406
R4-23-407
R4-23-409

Rulemaking Action

Amend
Amend
Amend
Amend
Amend
Amend

2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 32-1904(A)(1), and 32-1904(B)(3) and (5)

Implementing statutes: A.R.S. §§ 32-1926(B), 32-1927(B)(3), 32-1963.01(K), 32-1964 and 32-1968(C)

3. The effective date of the rules:

March 7, 2002

4. A list of all previous notices appearing in the Register addressing the proposed rule:

Notice of Rulemaking Docket Opening: 7 A.A.R. 978, February 23, 2001

Notice of Proposed Rulemaking: 7 A.A.R. 3204, August 3, 2001

Notice of Supplemental Proposed Rulemaking: 7 A.A.R. 4877, October 19, 2001

5. The name and address of agency personnel with whom persons may communicate regarding the rule:

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6. An explanation of the rule, including the agency's reasons for initiating the rule:

The Board's five-year rule review in September 1997 identified Sections R4-23-404, R4-23-405, R4-23-406, R4-23-407, and R4-23-409 for amending. Sections R4-23-404, R4-23-405, R4-23-406, and R4-23-409 are amended to increase the clarity, conciseness, and understandability of the sections. The definition for "immediate notice" in Section R4-23-405 is moved to Section R4-23-110 with the Board's other rule definitions. R4-23-406(A) and (B) are repealed, and R4-23-406(C) and (D) are renumbered. R4-23-406(A) is a repeat of statutory language and is not necessary. R4-23-406(B) is not necessary because the drugs listed in subsection (B)(1) are now available as FDA-approved generic equivalent drug products. The dosage forms listed in subsection (B)(2) are not substitutable by statutory definition in A.R.S. § 32-1963.01(L)(3). The amendments to Section R4-23-407 make changes that clarify prescription order requirements, prescription refill documentation requirements, and expand and improve the prescription transfer process and recordkeeping, by, among other things, making requirements for electronic transfer of a prescription between pharmacies owned by the same company and using a common database. The amended rule will include for-

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mat, style, and grammar changes necessary to comply with the current Administrative Procedure Act and Secretary of State rules.

The Board believes that making these rules will benefit the public health and safety by establishing standards for professional practices and benefit pharmacists and pharmacies by recognizing the use of improved technology as part of the established standards.

7. A reference to any study that the agency relied on in its evaluation of or justification for the rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study, and other supporting material:

Not applicable

8. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

9. The summary of the economic, small business, and consumer impact:

The cost to the Board of Pharmacy and the Secretary of State for writing and publishing the rules will be minimal. The proposed rules will have little economic impact on pharmacies. The rules clarify and update existing language that relates to unethical practices, change of pharmacist-in-charge, substitution of prescription drugs, prescription requirements, and returning drugs and devices. The proposed rules add subsection R4-23-407(D)(5) to establish standards for the electronic transfer of original prescription order information between pharmacies owned by the same company. This new subsection may provide a nonquantifiable cost savings to pharmacies related to more efficient use of pharmacy personnel and electronic prescription transfers. The existing rule require that a prescription transfer is made between two pharmacists. The proposed rule will allow the use of pharmacy interns and pharmacy technicians for many transfers. The use of nonpharmacist personnel for some prescription transfers may also provide a nonquantifiable cost savings to pharmacies through more efficient use of pharmacy personnel. The proposed rule will have no economic impact on the public. The majority of the changes in the proposed rules are updates in format, style, and grammar to provide a clear, concise, and understandable document. The Board, pharmacies, and the public benefit from rules that establish standards for unethical practices, change of pharmacist-in-charge, substitution of prescription drugs, prescription requirements, and returning drugs and devices in Arizona.

10. A description of the changes between the proposed rules, including supplemental notices, and final rules (if applicable):

At the request of G.R.R.C. staff, the Board made minor grammar, style, format, and punctuation changes where necessary and added a descriptive sentence and a new definition for the acronym, DEA, to the definitions Section R4-23-110. In response to written comment received by the Board and after some discussion, the Board made minor changes in subsections R4-23-404(B)(2) and R4-23-407(D)(2). The intent of subsection R4-23-404(B) is to prevent advertising on prescription blanks by a pharmacist or pharmacy. The written comment received by the Board expressed the concern that the language of subsection R4-23-404(B)(2) would prevent the patient-directed electronic transmission of a prescription order from a medical practitioner to a pharmacy. The Board does not agree with this interpretation, but chose to add the word "blank" after the word "order" in subsection R4-23-404(B)(2) to clarify that the purpose of the subsection language is to prevent advertising on a prescription blank by a pharmacist or pharmacy.

The written comment received by the Board expressed the concern that subsection R4-23-407(D)(2) is more restrictive than federal law and asked the Board to use the federal requirements. After some discussion, the Board decided that using the less restrictive federal requirements in subsection R4-23-407(D)(2) will continue the Board's goal of protecting public health and maintaining uniform controlled substance regulation between state and federal agencies. Subsection R4-23-407(D)(2) is changed by reformatting the subsection into (a) and (b) subsections and incorporating by reference 21 CFR 1306.25 in subsection (a). Because this involves a substantive change from the proposed rule, a Notice of Supplemental Proposed Rulemaking was published on October 19, 2001 and another public hearing was held on November 26, 2001. The final rule reflects the change made as noticed in the supplemental proposed rulemaking.

11. A summary of the principal comments and the agency response to them:

The Board received a written comment from the National Association of Chain Drug Stores (NACDS) voicing three concerns about the proposed rulemaking. The first concern involved subsection R4-23-404(B)(2). The NACDS is concerned that the subsection's language would affect a patient's ability to designate to which pharmacy a prescription could be transmitted electronically. While the Board does not agree with the NACDS's interpretation of the effect of subsection R4-23-404(B)(2), the Board decided to add the word "blank" after the word "order." It is the Board's contention that subsection R4-23-404(B)(2) deals with preventing advertising on prescription order-blanks by a pharmacist or pharmacy. The Board does not feel the subsection has any bearing on electronic prescription transmission and feels that the addition of the word "blank" should clarify that the Board's intent in subsection R4-23-404(B)(2) is to prevent prescription order-blank advertising.

The second concern involved subsection R4-23-407(D)(2). The NACDS is concerned because the subsection as proposed is more restrictive than federal law and could inhibit a patient's ability to obtain a controlled substance prescription in a timely manner. After some discussion, the Board agreed with the NACDS position. After publishing a

Notice of Supplemental Proposed Rulemaking and holding another public hearing, the Board changed the language in subsection R4-23-407(D)(2) to incorporate by reference 21 CFR 1306.25, the federal law specific to the transfer of original prescription order information for a Schedule III, IV, or V controlled substance. This change makes the final rule less restrictive than the proposed rule for pharmacists and pharmacies that share a common database without compromising public health and safety.

The third concern involved subsection R4-23-407(D)(6)(a) and (b). The NACDS is concerned that the subsection as proposed would not allow pharmacies with a shared or common database to transfer non-controlled prescription order information electronically when the transferring pharmacy is closed and the receiving pharmacy is open. The Board does not understand this concern because several chain pharmacies in Arizona have been transferring prescriptions electronically under a waiver from the Board for several years. When the Board originally gave the waiver for electronic transfers, it was with the understanding that the 24-hour pharmacies would be transferring prescriptions from closed pharmacies within their chain through the shared or common database. As the rule now specifically permits these electronic transfers, a waiver is no longer necessary. There is nothing in subsection R4-23-407(D)(6)(a) and (b) that prohibits a 24-hour pharmacy from transferring a prescription from a closed pharmacy with a shared or common database. The entire process of electronically transferring a prescription is driven from within the receiving pharmacy and does not actively involve the transferring pharmacy. Therefore, the Board decided not to change any part of subsection R4-23-407(D)(6)(a) and (b).

12. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

Not applicable

13. Incorporations by reference and their location in the rules:

21 CFR 1306.25, published April 1, 2001, and no future amendments or editions, located at R4-23-407(D)(2)(a)

14. Was this rule previously approved as an emergency rule?

No

15. The full text of the rules follows:

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 23. BOARD OF PHARMACY

ARTICLE 1. ADMINISTRATION

Section

R4-23-110. Definitions

ARTICLE 4. PROFESSIONAL PRACTICES

Section

R4-23-404. Unethical Practices

R4-23-405. Change of Responsibility

R4-23-406. Substitution for Prescription Drugs

R4-23-407. Prescription Requirements

R4-23-409. Returning Drugs and Devices

ARTICLE 1. ADMINISTRATION

R4-23-110. Definitions

In addition to definitions in A.R.S. § 32-1901, the following definitions apply to A.A.C. Title 4 Chapter 23:

“Active ingredient” No change

“Authentication of product history” No change

“AZPLEX” No change

“Batch” No change

“Beyond-use date” No change

“Biological safety cabinet” No change

“Certified pharmacy technician” No change

“Class 100 environment” No change

“Community pharmacy” No change

“Component” No change

“Computer system” No change

“Computer system audit” No change

“Container” No change

“Correctional facility” No change

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“CRT” No change
“Current good compounding practices” No change
“Current good manufacturing practice” No change
“Cytotoxic” No change
“Day” No change
“DEA” means the Drug Enforcement Administration as defined in A.R.S. § 32-1901.
“Delinquent license” No change
“Dispensing pharmacist” No change
“Drug sample” No change
“Extreme emergency” No change
“FDA” No change
“Immediate notice” means a required notice sent by mail, facsimile, or electronic mail to the Board Office within 24 hours.
“Inactive ingredient” No change
“Internal test assessment” No change
“Limited-service correctional pharmacy” No change
“Limited-service mail-order pharmacy” No change
“Limited-service nuclear pharmacy” No change
“Limited-service pharmacy permittee” No change
“Long-term care consultant pharmacist” No change
“Lot” No change
“Lot number” or “control number” No change
“Materials approval unit” No change
“Mediated instruction” No change
“NABP” No change
“NABPLEX” No change
“NAPLEX” No change
“Other designated personnel” No change
“Outpatient” No change
“Outpatient setting” No change
“Patient profile” No change
“Pharmaceutical care” No change
“Pharmacy law continuing education” No change
“Pharmacy technician” No change
“Prepackaged drug” No change
“Provider pharmacist” No change
“Radiopharmaceutical” No change
“Radiopharmaceutical quality assurance” No change
“Radiopharmaceutical services” No change
“Red C stamp” No change
“Remodel” No change
“Remote drug storage area” No change
“Resident” No change
“Responsible person” No change
“Score transfer” No change
“Sight-readable” No change
“Single-drug audit” No change
“Single-drug usage report” No change
“Sterile pharmaceutical product” No change
“Strength” No change
“Supervision” No change
“Supplying” No change
“Support personnel” No change
“Transfill” No change
“Wholesale distribution” No change
“Wholesale distributor” No change

ARTICLE 4. PROFESSIONAL PRACTICES

R4-23-404. Unethical Practices

- A.** Rebates prohibited: ~~The offer, delivery, receipt or acceptance, by any A pharmacist or non-pharmacist pharmacy permittee, of shall not offer, deliver, receive, or accept any unearned rebate, refund, commission, preference, patronage dividend, discount, or other unearned consideration, whether in the form of money or otherwise, as compensation or inducement for referring patients, clients, or customers to refer a patient, client, or customer to any person, irrespective of any membership, proprietary interest or co-ownership in or with any person to whom such patients, clients or customers are referred, is prohibited; except for those rebates a rebate or premiums that are premium paid completely and directly to the a patient. Among other things, this A pharmacist or pharmacy permittee shall include the following not:~~
1. ~~Payment to medical practitioner: Payment~~ Make payment to a medical practitioner in money or other consideration for a prescription ~~orders~~ order prescribed by the ~~medical practitioner;~~ or
 2. ~~Payment to nursing home: Payment~~ Make payment to a ~~nursing home~~ long-term care or assisted living facility or other health care institution in money, discount, rental, or other consideration in an amount above the prevailing rate for:
 - a. ~~Prescription medication or devices dispensed or sold for the patients a patient or inhabitants resident of such the facility or institution above the prevailing rate which might be considered a rebate; or~~
 - b. Drug selection or drug utilization review services, drug therapy management services, or other pharmacy consultation services provided for a patient or resident of the facility or institution.
- B.** Prescription ~~order-blanks~~ order-blank advertising prohibited: ~~No A pharmacist or pharmacy permittee shall not:~~
1. ~~Directly or indirectly furnish, or cause to be furnished to, any medical practitioner to a medical practitioner a prescription order-blanks referring order-blank that refers to any a specific pharmacist or pharmacy in any manner whatsoever; or~~
 2. ~~No pharmacist or pharmacy shall~~ Actively or passively participate in any arrangement or agreement whereby where a prescription orders are order-blank is prepared, written, or issued in a manner which that refers to a specific pharmacist or pharmacy.
- C.** ~~Claiming professional superiority: No pharmacist shall advertise professional superiority in a manner to reflect adversely on the qualifications of others.~~
- D-C.** ~~Fraudulent claim for service: No A pharmacist or pharmacy permittee shall not claim the performance of a service which he that the pharmacist or pharmacy permittee knows or should have known had know was not been performed; such as, claiming to have dispensed dispense a prescription medication that was is not dispensed.~~
- E-D.** ~~Fraudulent claim for a fee: No A pharmacist or pharmacy permittee:~~
1. ~~shall Shall not~~ claim a fee for a service that was is not performed or was not earned;
 2. ~~It is not fraudulent to May~~ divide a prescription order into two or more portions of prescription medication at the request of the a patient, or for some other ethical reason, and charge a dispensing fee for such the additional service; and
 3. ~~It is fraudulent to Shall not~~ divide such a prescription order merely to obtain an additional fee.
- F.** ~~Acceptance of prescription order and distribution of prescription medication: No pharmacist shall participate in any arrangement or agreement whereby prescription orders or prescription medication may be left at, picked up from, accepted by, or delivered to any place of business not licensed as a pharmacy; provided, however, that nothing in this regulation shall prohibit a pharmacist or pharmacy by means of its employee or by use of a common carrier, from picking up prescription orders or delivering prescription medications at the office or home of the medical practitioner, at the residence of the patient, or at the hospital or medical care facility in which the patient is confined.~~
- G-E.** ~~Prohibiting prescribed drugs a prescription-only drug or device from being dispensed over the counter: No A pharmacist shall ensure that:~~
1. ~~A prescription-only drug or device shall be dispensed from the information on a prescription order unless the prescription medication or device is properly dispensed, labeled is dispensed only after receipt of a valid prescription order from a licensed medical practitioner;~~
 2. ~~The dispensed prescription-only drug or device is properly prepared, packaged, and labeled according to this Chapter; and~~
 3. ~~The The~~ prescription order is filed according to this Chapter.

R4-23-405. Change of Responsibility

- A.** A pharmacist designated as the pharmacist-in-charge for a pharmacy, manufacturer, or other establishment shall give immediate ~~written notice, as defined in R4-23-110, when:~~
1. ~~of the termination of such The pharmacist's responsibility as a pharmacist-in-charge is terminated; or~~
 2. ~~shall make such a notification The pharmacist knows of a pending termination whenever he has such information of the pharmacist's responsibility as the pharmacist-in-charge.~~
- B.** ~~"Immediate notice" means a notice sent to the executive director within 24 hours of such termination or knowledge of pending termination.~~

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R4-23-406. Substitution for Prescription Drugs

A. All drugs shall comply with federal law.

B. Exclusions:

1. The following dosage forms shall not be substituted:
 - a. ~~Injectable suspensions other than antibiotics;~~
 - b. ~~Suppositories containing active ingredients of which systemic absorption is necessary for therapeutic activity; and~~
 - c. ~~Different delivery systems for aerosol and nebulizer drugs.~~
2. The following are not interchangeable:
 - a. ~~Creams for ointments or ointments for creams;~~
 - b. ~~Tablets for capsules or capsules for tablets; and~~
 - c. ~~Elixirs for syrups or syrups for elixirs.~~

~~C.~~ **A.** Approved abbreviations. ~~Whenever~~ If a substitution is made pursuant to under A.R.S. § 32-1963.01, a pharmacist may use the approved abbreviation that accompanies the name of the manufacturer or distributor listed in subsection ~~(D)~~ (B) of this Section.

~~D.~~ **B.** Manufacturers and distributors. The names of manufacturers and distributors ~~which that have met~~ meet the requirements of A.R.S. § 32-1963.01 ~~(H)~~ (H) are recorded and available as a list at the Board office and at www.pharmacy.state.az.us.

R4-23-407. Prescription Requirements

A. Prescription orders. A pharmacist shall ensure that:

1. A prescription order dispensed by the pharmacist shall include ~~shall include~~ includes the following information:
 - a. Date of issuance;
 - b. Name and address of the ~~person to whom,~~ patient for whom, or the owner of the animal for which the drug or device is dispensed;
 - c. ~~Name of Drug name,~~ strength, and dosage form or device name;
 - d. Name of the drug's or device's manufacturer or distributor ~~when if the prescription order is~~ written generically or a substitution is made;
 - e. ~~Strength~~ Prescribing medical practitioner's directions for use;
 - f. Date of dispensing;
 - g. Quantity prescribed and if different, quantity dispensed;
 - h. For a prescription order for a controlled substance, the medical practitioner's address and DEA number;
 - i. For a written prescription order, the medical practitioner's signature;
 - j. For an oral prescription order, the medical practitioner's name and telephone number; and
 - k. Name or initials of the dispensing pharmacist ~~or medical practitioner dispensing the drug; and~~
 - l. In the case of an oral prescription, the prescriber's instructions written on the face of the prescription by the pharmacist.
2. ~~Records of dispensing prescription-only drugs shall be made and kept for three years by wholesalers, manufacturers, pharmacies, and, except when administered to a patient upon whom the medical practitioner personally attends, by medical practitioners. A prescription order is kept by the pharmacist or pharmacy permittee as a record of the dispensing of a drug or device for three years from the date the drug or device is dispensed, except for a drug or device personally administered by a medical practitioner to the medical practitioner's patient; and~~
3. The ~~direct~~ dispensing of a ~~prescription medication shall comply~~ drug or device complies with the packaging requirements of the United States Pharmacopeia official compendium ~~and of the Consumer Product Safety Commission state and federal law.~~

B. Prescription refills. A pharmacist shall ensure that the following information ~~shall be~~ is recorded on the back of a prescription order when it is refilled:

1. Date refilled;
2. Quantity dispensed;
3. Name or approved abbreviation of the manufacturer or distributor ~~when if the prescription order is~~ written generically or a substitution is made; and
4. The name or initials of the dispensing pharmacist ~~or intern.~~

C. ~~A copy of a prescription order is not a valid prescription order and may not be dispensed. A pharmacist may furnish a copy of a prescription order to the patient for whom it was is prescribed or to the authorized representative of such the patient if such the copy is clearly marked "COPY FOR REFERENCE PURPOSES ONLY". ONLY.~~ A copy of a prescription order is not a valid prescription order and a pharmacist shall not dispense a drug or device from the information on a copy.

D. Transfer of prescription order information. For a transfer of prescription order information to be valid, a pharmacy permittee or pharmacist-in-charge shall ensure that:

1. Both the original and the transferred prescription ~~must be~~ order are maintained for ~~a period of three years from the date of~~ after the last refill dispensing date.

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2. Pharmacies electronically accessing the same prescription record must satisfy all the information requirements of a manual mode for the prescription transferral.
3. ~~2. Original~~ The original prescription order information may be for a Schedule III, IV, or V controlled substance is transferred one time during the life of the only as specified in 21 CFR 1306.25, published April 1, 2001, and no future amendments or editions, incorporated by reference and on file with the Board and the Office of the Secretary of State, prescription in the case of Schedule III, IV, and V controlled substances and
3. ~~Without~~ The original prescription order information for a non-controlled substance drug is transferred without limitation only up to the number of originally authorized refills in the case of non-controlled prescription-only drugs.
4. Transfer within Arizona.
 - a. ~~Transfer~~ The transfer of original prescription order information for a non-controlled prescription-only drugs substance drug must meet meets the following conditions:
 - i. ~~Transfer~~ The transfer of information is communicated directly between;
 - (1) ~~two~~ Two licensed pharmacists,
 - (2) A licensed pharmacist and a licensed pharmacy or graduate intern, or
 - (3) Two licensed pharmacy or graduate interns;
 - ii. The following information is recorded by the transferring pharmacist or pharmacy or graduate intern:
 - (1) The word "void" is written on the face of the invalidated original prescription unless it is an electronic or oral transfer and the transferred prescription order information is invalidated in the transferring pharmacy's computer system; and
 - (2) The name and address of the pharmacy to which the prescription was is transferred, the name of the receiving pharmacist or pharmacy or graduate intern receiving the prescription information, the date of transfer, and the name of the transferring pharmacist or pharmacy or graduate intern who transfers the information is written on the back of the prescription; or entered into the transferring pharmacy's computer system; and
 - iii. The following information is recorded by the receiving pharmacist receiving the transferred prescription or pharmacy or graduate intern on the transferred prescription order:
 - (1) The word "transfer" is written on the face of the transferred prescription;
 - (2) The following information is recorded on the transferred prescription:-
 - (a) Date of issuance of the original prescription order;
 - (3) (b) Original number of refills authorized on the original prescription order;
 - (4) (c) Date of original dispensing;
 - (5) (d) Number of valid refills remaining and the date of the last refill;
 - (6) (e) Name, address, and original prescription number of the pharmacy from which the prescription was is transferred;
 - (7) (f) Name of the transferring pharmacist or pharmacy or graduate intern; and
 - (8) (g) Name of the receiving pharmacist or pharmacy or graduate intern receiving the prescription.
 - b. ~~Transfer~~ The transfer of original prescription order information for a Schedule III, IV, and or V controlled substances must meet substance meets the following conditions:
 - i. ~~Transfer~~ The transfer of information is communicated directly between two licensed pharmacists;
 - ii. The following information is recorded by the transferring pharmacist:
 - (1) The word "void" is written on the face of the invalidated original prescription order unless it is an electronic or oral transfer and the transferred prescription order information is invalidated in the transferring pharmacy's computer system; and
 - (2) The name, address, and DEA number of the pharmacy to which the prescription was is transferred, the name of the receiving pharmacist receiving the prescription information, the date of transfer, and the name of the transferring pharmacist who transfers the information is written on the back of the prescription; order or entered into the transferring pharmacy's computer system; and
 - iii. The following information is recorded by the receiving pharmacist receiving the transferred prescription on the transferred prescription order:
 - (1) The word "transfer" is written on the face of the transferred prescription;
 - (2) The following information is recorded on the transferred prescription:-
 - (a) Date of issuance of original prescription order;
 - (3) (b) Original number of refills authorized on the original prescription order;
 - (4) (c) Date of original dispensing;
 - (5) (d) Number of valid refills remaining and the date of the last refill;
 - (6) (e) Name, address, DEA number, and original prescription number of the pharmacy from which the prescription was is transferred;
 - (7) Name of the transferring pharmacist; and
 - (8) Name of the receiving pharmacist.

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5. ~~Transfer from out-of-state; out-of-state.~~
 - a. ~~Transfer~~ The transfer of original prescription order information for a non-controlled prescription only drugs must meet substance drug meets the conditions set forth in subsections (D)(4)(a)(i) and (D)(4)(a)(iii) of this rule.
 - b. ~~Transfer~~ The transfer of original prescription order information for a Schedule III, IV, and or V controlled substances must meet substance meets the conditions set forth in subsections (D)(4)(b)(i) and (D)(4)(b)(iii) of this rule.
6. Electronic transfer. The electronic transfer of original prescription order information meets the following conditions:
 - a. The electronic transfer is between pharmacies owned by the same company using a common or shared database;
 - b. The electronic transfer of original prescription order information for a non-controlled substance drug is performed by a pharmacist or a pharmacy or graduate intern or pharmacy technician under the supervision of a pharmacist;
 - c. The electronic transfer of original prescription order information for a controlled substance is performed between two licensed pharmacists;
 - d. The electronic transfer of original prescription order information for a non-controlled substance drug meets the following conditions:
 - i. The transferring pharmacy's computer system:
 - (1) Invalidates the transferred original prescription order information;
 - (2) Records the identification code, number, or address of the pharmacy to which the prescription order information is transferred;
 - (3) Records the name or identification code of the receiving pharmacist, pharmacy or graduate intern, or pharmacy technician;
 - (4) Records the date of transfer; and
 - (5) Records the name or identification code of the transferring pharmacist, pharmacy or graduate intern, or pharmacy technician; and
 - ii. The electronic prescription order information received by the computer system of the receiving pharmacy includes the information required in subsection (D)(4)(a)(iii);
 - e. The electronic transfer of original prescription order information for a controlled substance meets the following conditions:
 - i. The transferring pharmacy's computer system:
 - (1) Invalidates the transferred original prescription order information;
 - (2) Records the identification code, number, or address, and DEA number of the pharmacy to which the prescription order information is transferred;
 - (3) Records the name or identification code of the receiving pharmacist;
 - (4) Records the date of transfer; and
 - (5) Records the name or identification code of the transferring pharmacist; and
 - ii. The electronic prescription order information received by the computer system of the receiving pharmacy includes the information required in subsection (D)(4)(b)(iii); and
 - f. In addition to electronic documentation of a transferred prescription order in the computer system, an original prescription order containing the requirements of this Section is filed in compliance with A.R.S. § 32-1964.

R4-23-409. Returning Drugs and Devices

- A. ~~After it has been taken a person for whom a drug is prescribed or the person's agent takes the drug from the premises where sold, distributed, or dispensed, no drug a pharmacist or pharmacy permittee shall be accepted not accept the drug for return or exchange for the purpose of resale unless the following conditions have been met the pharmacist determines that:~~
 1. ~~It~~ The drug is in the its original, manufacturer's, unopened container; and
 2. The drug or its container has not been subjected to contamination or deterioration.
- B. The provisions of subsection (A) of this Section do not apply to drugs a drug dispensed to:
 1. A hospital inpatients (see R4-23-659(B)) inpatient as defined in R4-23-651; or
 2. To nursing home residents A resident of a long-term care facility where a licensed health care professional administers the drug, and the pharmacist ensures and documents that the drug:
 - a. Has been stored in compliance with the requirements of the official compendium; and
 - b. Is not obviously contaminated or deteriorated.
- C. ~~After it has left a person for whom a device is prescribed or the person's agent takes the device from the premises of the seller where sold, distributed, or dispensed, no device a pharmacist or pharmacy permittee shall be accepted not accept the device for return or exchange for the purpose of resale or reuse unless the following conditions have been met the pharmacist determines that:~~
 1. ~~It~~ The device is found to be inspected and is free of defects after inspection;
 2. ~~It~~ The device is rendered incapable of transferring disease; and
 3. ~~It~~ The device, if resold or reused, is not claimed to be new or unused.

Editor's Note: The following Notice of Final Rulemaking is published in two parts. Part 1 contains the Preamble, and Part 2 contains the text of the rules.

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TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY WATER QUALITY STANDARDS

PREAMBLE

1. Sections Affected

R18-11-101
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R18-11-121
R18-11-122
R18-11-123
Appendix A
Appendix B

Rulemaking Action

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2. The specific authority for the rulemaking, including both the authorizing statute (general) and the specific statutes the rules implement:

Authorizing statutes: A.R.S. §§ 49-202(A), 49-203(A)(1), and 49-221

Implementing statute: A.R.S. § 49-222

3. The effective date of the rules:

March 8, 2002

4. A list of all previous notices appearing in the Register addressing the final rule:

Notice of Rulemaking Docket Opening: 7 A.A.R. 2017, May 4, 2001

Notice of Proposed Rulemaking: 7 A.A.R. 1819, May 4, 2001

5. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Mr. Steven Pawlowski

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6. An explanation of the rules, including the agency's reasons for initiating the rules:

The Clean Water Act requires that ADEQ initiate a Water Quality Standards rulemaking.

Almost 30 years ago, Congress enacted landmark legislation to prevent water pollution in the nation's waters. This legislation was the Federal Water Pollution Control Act Amendments of 1972. The Federal Water Pollution Control Amendments of 1972 and subsequent amendments are commonly known as the Clean Water Act [33 U.S.C. §§ 1251

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to 1387]. In the Clean Water Act, Congress directed states to adopt water quality standards for “waters of the United States” located within the states’ jurisdictions.

§ 303(c) of the Clean Water Act [33 U.S.C. 1313(c)] provides the basis in federal law for Arizona’s surface water quality standards program. The key elements of § 303(c) of the Clean Water Act are:

1. § 303(c) defines a water quality standard as the designated uses of a surface water and the water quality criteria necessary to support those uses [See § 303(c)(2)(A)].
2. A state must consider the use of surface waters for public water supply, propagation of fish and wildlife, recreation, agricultural uses, industrial uses, and navigation when it establishes water quality standards [See § 303(c)(2)(A)].
3. State-adopted water quality standards must protect the public health and welfare, enhance the quality of water, and “serve the purposes of the Clean Water Act” [See § 303(c)(2)(A)].
4. States must review their water quality standards at least once every three years using a process that includes public participation [See § 303(c)(1)].
5. The U.S. Environmental Protection Agency (EPA) reviews state-adopted water quality standards. § 303(c) provides authority for the federal promulgation of a water quality standard if EPA determines that a state-adopted water quality standard is inconsistent with applicable requirements of the Clean Water Act or EPA determines that a federal water quality standard is necessary to meet the requirements of the Clean Water Act [See § 303(c)(2)(A), § 303(c)(3) and § 303(c)(4)].
6. States are required to adopt water quality criteria for toxic pollutants listed under § 307(a)(1) of the Clean Water Act [33 U.S.C. § 1317(a)(1)] for which EPA has published national criteria guidance if the presence of a toxic pollutant in a surface water could reasonably be expected to interfere with the designated uses of a surface water. The 126 toxic pollutants listed under § 307(a)(1) of the Clean Water Act are called the priority pollutants. Water quality criteria for priority pollutants must be numeric criteria (except where numeric criteria are unavailable). If numeric criteria for a priority pollutant are unavailable, then a state must adopt water quality criteria based on biological monitoring or assessment methods consistent with EPA guidance

[See § 303(c)(2)(B) and § 304(a)(8)].

§ 303(c) of the Clean Water Act requires that Arizona establish surface water quality standards and review them every three years. This review process is known as the triennial review.

State Law Requires That ADEQ Initiate a Water Quality Standards Rulemaking

A.R.S. § 49-202(A) designates the Arizona Department of Environmental Quality [ADEQ] as the state agency for all purposes of the Clean Water Act. As the responsible state agency in Arizona, ADEQ must implement the requirements of § 303(c) of the Clean Water Act stated above. ADEQ has a duty to conduct the triennial review of surface water quality standards, and, as appropriate, adopt or modify the standards.

Arizona law requires that ADEQ adopt or modify water quality standards through a rulemaking process [See A.R.S. § 49-203 and A.R.S. § 49-221]. A.R.S. § 49-203(A)(1) states that ADEQ shall adopt, by rule, water quality standards in accordance with legislative guidelines prescribed by Title 49, Chapter 2, Article 2 of the Arizona Revised Statutes. Title 49, Chapter 2, Article 2 of the Arizona Revised Statutes addresses water quality standards.

A.R.S. § 49-221 addresses water quality standards generally and A.R.S. § 49-222 specifically addresses water quality standards for “navigable waters” [See discussion of the applicability of water quality standards to “waters of the United States,” “navigable waters,” and “surface waters” later in this preamble]. A.R.S. § 49-221(A) requires ADEQ to adopt water quality standards by rulemaking for all navigable waters to preserve and protect water quality for all present and reasonably foreseeable future uses.

A.R.S. § 49-221(C) states that ADEQ must consider the following factors when the agency establishes water quality standards:

1. The protection of the public health and the environment;
2. The uses which have been made, are being made, or with reasonable probability may be made of surface waters;
3. The provisions and requirements of the Clean Water Act and Safe Drinking Water Act [42 U.S.C. §§ 201, 300f to 300j-9] and the federal regulations adopted pursuant to those acts;
4. The degree to which standards for one category of waters [for example, surface water] could cause violations of standards for other, hydrologically-connected water categories [for example, groundwater];
5. Guidelines, action levels, or other numeric criteria adopted or recommended by EPA or any other federal agency; and
6. Any unique, physical, biological, or chemical properties of the waters.

Arizona law requires that surface water quality standards be expressed in terms of the uses to be protected. There is a statutory preference for numeric water quality standards if adequate information exists to establish a numeric stan-

dard. ADEQ also has authority to adopt any narrative water quality standard that ADEQ deems appropriate [See A.R.S. § 49-221(D)].

A.R.S. § 49-222 prescribes legislative guidelines for the surface water quality standards program, restating some of the language in § 303(c)(2)(A) of the Clean Water Act. A.R.S. § 49-222(A) requires that surface water quality standards assure water quality, if attainable, that provides for protecting the public health and welfare. A.R.S. § 49-222(A), like § 303(c)(2)(A) of the Clean Water Act, says that the state's water quality standards shall enhance the quality of the water taking into consideration its use and value for public water supplies, the propagation of fish and wildlife, and for recreational, agricultural, industrial, and other purposes, including navigation.

A.R.S. § 49-222(B) requires that ADEQ adopt numeric water quality standards for surface waters for each toxic pollutant listed by EPA under § 307 of the Clean Water Act [33 U.S.C. § 1317]. That is, ADEQ must adopt standards for each of the 126 priority pollutants. A.R.S. § 49-222(C) states that when ADEQ establishes numeric water quality standards, ADEQ may consider the effect of local water quality characteristics on the toxicity of specific pollutants, the varying sensitivities of local affected aquatic populations to toxic pollutants, and the extent to which the natural flow of a stream is intermittent or ephemeral resulting in a stream where the in-stream flow consists mostly of treated wastewater effluent. However, ADEQ may not establish a numeric water quality standard that is inconsistent with the Clean Water Act.

The purposes of the water quality standards program

Water quality standards are one of the cornerstones of the Clean Water Act and they play a central role in the successful implementation of Arizona's water quality management programs. Water quality standards define the water quality goals for surface waters in Arizona. They designate the uses to be protected in Arizona's surface waters and they prescribe the criteria that ADEQ determines are necessary to maintain and protect water quality for the designated uses. Water quality standards provide the regulatory basis for establishing water quality-based discharge limitations and other discharge controls in National Pollutant Discharge Elimination System (NPDES) permits for point source discharges to surface waters. These water quality-based discharge limitations may be more stringent than technology-based effluent limitations for point sources that EPA prescribes in federal effluent guidelines regulations that implement the Clean Water Act. The water quality standards also provide the regulatory basis for establishing wasteload allocations and load allocations in total maximum daily load (TMDL) analyses. Water quality standards provide the basis for the implementation of best management practices (BMPs) to control nonpoint sources of pollution and for measuring the effectiveness of the BMPs. Finally, water quality standards provide the "yardstick" by which ADEQ assesses the water quality status of Arizona's rivers, streams, and lakes.

Water quality standards are established to "serve the purposes" of the Clean Water Act. These purposes are set forth in § 101 of the Clean Water Act [33 U.S.C. § 1251]. The primary objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Congress articulated two ambitious goals in the Clean Water Act to achieve the primary objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. First, Congress set a goal of eliminating completely the discharge of pollutants into the waters of the United States. Second, Congress prohibited the discharge of toxic pollutants in toxic amounts to those waters [See § 101(a)(1) and (3)]. While great progress has been made in improving water quality in the nation's waters since the enactment of the Clean Water Act, neither of these two ambitious national goals have been achieved within the original deadlines prescribed in the Clean Water Act.

Congress also set forth an interim water quality goal to achieve, wherever attainable, a level of surface water quality that provides for: 1) the protection and propagation of fish, shellfish, and wildlife, and 2) recreation in and on the water. This interim water quality goal is known as the "fishable, swimmable" goal of the Clean Water Act [See § 101(a)(2)]. In 1972, Congress envisioned that all of the waters of the United States should be fishable and swimmable wherever that level of water quality was attainable. The "fishable, swimmable" goal of the Clean Water Act has had a significant impact on Arizona's surface water quality standards. It has had a major impact on the types of designated uses that have been established for surface waters in Arizona and the stringency of the water quality criteria that are prescribed to maintain and protect water quality for the designated uses.

Summary of major issues for this triennial review

ADEQ considers revisions to the state's surface water quality standards in the triennial review. Water quality standards revisions may take many forms, including additions or modifications to designated uses, changes to water quality criteria, revisions to the state's antidegradation policy, new unique water or effluent-dependent water classifications, and changes to general policies such as variances, nutrient waivers, and mixing zones. ADEQ made the following revisions to the surface water quality standards in this triennial review:

1. ADEQ revised the current definitions for "aquatic and wildlife (cold water fishery)," "aquatic and wildlife (warm water fishery)," "ephemeral water," and "effluent dependent water." ADEQ also added new definitions for "perennial surface water," "intermittent surface water," and "pollutant."
2. ADEQ revised the tributary rule at R18-11-105 as follows:
 - a. ADEQ repealed references in R18-11-105(2) to unlisted tributaries that are effluent-dependent waters (EDWs). Under current state law, an EDW can be classified only through the rulemaking process. Consequently, every EDW in Arizona is specifically listed in the surface water quality standards rules. ADEQ

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- deleted R18-11-105(2) because it is impossible to have an *unlisted* tributary that is an EDW.
- b. ADEQ clarified how the tributary rule applies to perennial and intermittent streams that are above and below 5000 feet in elevation. The current tributary rule assigns designated uses to unlisted tributaries that are neither ephemeral waters nor effluent-dependent waters and that have salmonids present [See R18-11-105(3)]. ADEQ repealed the language in R18-11-105(3) that refers to an “unlisted tributary that is not an ephemeral water or an effluent-dependent water and which has salmonids present.” ADEQ revised the subsection to clarify that it applies to unlisted tributaries that are perennial or intermittent surface waters. ADEQ also conformed this section of the tributary rule to be consistent with revised definitions of “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water).” The revised tributary rule reads: “The aquatic and wildlife (cold water), full-body contact, and fish consumption standards apply to an unlisted tributary that is a perennial or intermittent surface water and is above 5000 feet in elevation.”
 - c. ADEQ made similar revisions to part of the tributary rule that assigns designated uses to unlisted tributaries that are neither ephemeral nor effluent-dependent waters and that do not have salmonids present [See R18-11-105(4)]. Again, ADEQ repealed language that refers to an “unlisted tributary that is not an ephemeral water or an effluent-dependent water and which does not have salmonids present” and clarified that R18-11-105(4) applies to unlisted tributaries that are perennial or intermittent surface waters. The revised rule states: “The aquatic and wildlife (warm water), full-body contact, and fish consumption standards apply to an unlisted tributary that is a perennial or intermittent surface water and is below 5000 feet in elevation.”
 - d. ADEQ repealed the part of the current tributary rule that applies the nearest downstream surface water quality standards to unlisted tributaries that are neither ephemeral waters or EDWs.
3. ADEQ repealed part of the current antidegradation rule at R18-11-107(D) that extends Tier 3 antidegradation protection to *proposed* unique waters. The revised rule states at R18-11-107(D) that Tier 3 antidegradation protection applies only to surface waters that are actually classified as unique waters through the rulemaking process.
 4. ADEQ amended R18-11-108(A)(4), the narrative standard that states that a surface water shall be free from pollutants in amounts or combinations that cause off-flavor in aquatic organisms or waterfowl. The revised narrative standard still prohibits pollutants in surface waters that cause off-flavor in aquatic organisms. However, ADEQ repealed the reference to “or waterfowl” in this narrative standard because of the lack of practical implementation procedures to determine compliance with the “or waterfowl” part of the narrative standard.
 5. ADEQ amended R18-11-108(A)(1), the narrative standard that addresses bottom deposits. ADEQ revised the rule to clarify that the narrative standard is intended to prevent bottom deposits that impair aquatic life designated uses. ADEQ repealed language in the current standard that relates to the impairment of recreational uses because of the lack of objective criteria to determine when there is impairment of a recreational use and the lack of practical procedures to implement that part of the narrative standard.
 6. ADEQ adopted a new narrative standard to address excessive concentrations of suspended solids in a surface water that impair the domestic water source use [See R18-11-108(C)].
 7. ADEQ revised the current numeric water quality standards for bacteria in R18-11-109 as follows:
 - a. ADEQ repealed the current fecal coliform criteria for the domestic water source (DWS), partial-body contact (PBC), aquatic and wildlife uses (A&Wc, A&Ww, and A&We), agricultural irrigation (AgI), and agricultural livestock watering (AgL) designated uses. ADEQ repealed the fecal coliform criteria because: 1) ADEQ questions the scientific basis of the current fecal coliform criteria for these designated uses, 2) microbiological water quality will be maintained and protected because *E. coli* criteria will apply to all surface waters through the full-body contact (FBC) and PBC designated uses, and 3) the repeal of the fecal coliform criteria eliminates unnecessary and redundant monitoring requirements.
 - b. ADEQ adopted new *E. coli* criteria for the PBC designated use. The new *E. coli* criteria replace the current fecal coliform criteria for PBC.
 - c. ADEQ established the following *E. coli* criteria for the FBC and PBC designated uses:
 1. A geometric mean of 126 cfu / 100 ml for both the FBC and PBC designated uses,
 2. A single sample maximum concentration of 235 cfu / 100 ml for the FBC designated use, and
 3. A single sample maximum concentration of 576 cfu / 100 ml for the PBC designated use.
 - d. ADEQ repealed the current fecal coliform criteria for EDWs in R18-11-109(B)(2). Public health will be protected by *E. coli* criteria that ADEQ adopted that apply to surface waters with the PBC designated use. All EDWs have a PBC designated use.
 8. ADEQ revised the water quality standard for temperature at R18-11-109(E) to clarify that the criterion for “maximum change in temperature due to discharge” applies only to thermal discharges and it does not apply to storm water discharges. ADEQ revised footnote 4 at the end of R18-11-109 to state that the maximum temperature change criterion due to discharge does not apply to wastewater treatment plants that discharge to an EDW *or to a storm water discharge*.
 9. ADEQ repealed the numeric criteria for turbidity in R18-11-109(F) that are established to maintain and protect water quality for aquatic life designated uses. Instead, ADEQ adopted a new numeric criterion for suspended sedi-

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ment concentration (SSC) in R18-11-109(D) to protect aquatic life. The proposed SSC criterion is intended to apply at or near base flow and it does not apply to a surface water at times when there is elevated flow that is a direct response to a precipitation event.

10. ADEQ added a subsection (B) to R18-11-110 to incorporate by reference the Colorado River Salinity Control Forum plan of implementation.

11. ADEQ revised the unique waters rule at R18-11-112 to clarify the eligibility, nomination, and decision-making procedures and to include additional factors that ADEQ will consider when making decisions regarding unique water nominations and classifications. ADEQ received 37 nominations for unique waters classification in this triennial review. ADEQ proposes to classify nine surface waters as unique waters in the final rules. The nine surface waters are:

- a. Lee Valley Creek (above Lee Valley Lake) in the Little Colorado River watershed;
- b. Bear Wallow Creek,
- c. North Fork of Bear Wallow Creek,
- d. South Fork of Bear Wallow Creek,
- e. Snake Creek,
- f. Stinky Creek, and
- g. Hay Creek in the Salt River watershed;
- h. Upper Cienega Creek in the Santa Cruz River watershed; and
- i. KP Creek in the Upper Gila River watershed.

ADEQ decided not to propose Pinto Creek, Lower Haunted Canyon Creek, and 26 other streams that were nominated for unique waters classification. Finally, ADEQ decided *not* to revise the current listing of People's Canyon Creek as a unique water as requested by the Bureau of Land Management.

12. ADEQ revised the current definition of "effluent-dependent water" by removing the word, "primarily," in the current definition and adding clarifying language. ADEQ added Lake Cochise as an EDW and revised the EDW description of Queen Creek and Mule Gulch in R18-11-113. Finally, ADEQ adopted a site-specific standard for dissolved copper of 36 µg / L for the Rio de Flag.

13. ADEQ revised the mixing zone rule at R18-11-114. The current mixing zone rule prohibits acute toxicity in a mixing zone [See R18-11-114(F)]. A complete prohibition of acute toxicity is inconsistent with current EPA guidance on mixing zones and the concept of a zone of passage that is currently allowed by the state mixing zone rule at R18-11-114 (I). ADEQ also made changes to the administrative procedures that apply to requests for a mixing zone. The current rule states that mixing zones are established by order of the Director. ADEQ revised the rule to clarify that mixing zones are established as part of a NPDES permit for a point source discharge to a surface water and not by administrative order. Finally, ADEQ prohibited mixing zones for certain persistent, bioaccumulative pollutants, including: chlordane, DDT and its metabolites (DDD and DDE), dieldrin, dioxin, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, lindane, mercury, PCBs, and toxaphene.

14. ADEQ repealed the nutrient waiver rule at R18-11-115.

15. ADEQ repealed R18-11-118(B) that relates to dams and flood control structures. R18-11-118(B) states that nothing in the surface water quality standards rules "shall be construed to require a person who operates a dam or flood control structure to operate the structure to cure or mitigate an exceedance of a water quality standard caused by another person." This provision is an unnecessary restatement of R18-11-118(C).

16. ADEQ amended R18-11-120(C). ADEQ revised language in the current rule that relates to how compliance with chronic aquatic and wildlife criteria is determined. The current rule states that compliance with chronic aquatic and wildlife criteria shall be determined from the arithmetic mean of the analytical results of grab samples collected over a period of four consecutive days at a minimum rate of one grab sample per day. The final rule states that ADEQ will determine compliance with chronic aquatic and wildlife criteria from the geometric mean of the analytical results of the last four samples taken provided the samples are taken at least 24 hours apart.

17. ADEQ amended language in R18-11-121(B) that prohibits a schedule of compliance for a new point source. ADEQ added language authorizing schedules of compliance for new and recommencing point sources. The revised rule is consistent with the federal NPDES permit regulation that addresses schedules of compliance for new and recommencing point source dischargers at 40 CFR § 122.47. A schedule of compliance for a new point source is authorized only when one is necessary to allow a reasonable opportunity to attain compliance with a water quality standard that is issued after commencement of construction but less than three years before commencement of discharge. A schedule of compliance for a recommencing discharger is authorized when necessary to allow a reasonable opportunity to attain compliance with a water quality standard that has been issued or revised less than three years before recommencement of discharge.

18. ADEQ amended the variance rule at R18-11-122 to authorize a variance from a water quality standard on the ground that human-caused conditions or sources of pollution prevent attainment of a water quality standard and the conditions or sources of pollution cannot be remedied within five years. The added ground for a variance is based upon an assumption that attainment of the water quality standard can ultimately be achieved and that the human-

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caused conditions or sources of pollution can be remediated eventually but may not be achieved within the next five years. The additional ground for a variance is consistent with EPA guidance on variances and is based on one of the grounds for use attainability analysis identified by EPA in 40 CFR § 131.10(g)(3).

19. ADEQ amended R18-11-123 to prohibit the discharge of sewage from vessels to Lake Powell.

20. Revisions to Appendix A:

- a. ADEQ revised the current sulfide standards that are established to protect the aquatic and wildlife designated uses. The current sulfide criteria are found in Appendix A, Table 2 of the surface water quality standards rules. The current sulfide criterion of 100 mg / L was established to prevent acute toxicity to aquatic organisms. However, this criterion applies to all surface waters and it does not distinguish between lentic systems (lakes, reservoirs, and ponds) and lotic systems (rivers and streams). ADEQ clarified how the sulfide standard applies to lakes by adding a footnote to explain that the sulfide water quality criterion of 100 mg/L applies only to water samples that are taken from the epilimnion, or the upper layer of a lake or reservoir.
- b. ADEQ added tables to Appendix A for certain hardness-dependent and pH-dependent parameters. The current acute and chronic aquatic and wildlife criteria for cadmium, chromium III, copper, lead, nickel, pentachlorophenol, silver, and zinc are expressed as mathematical equations that factor in the hardness or pH of the receiving surface water to derive a numeric water quality criterion. ADEQ retained the equations in the rule as standards. However, the calculated criteria for the parameters are not presented in the current rules. The applicable numeric criterion must be calculated using mathematical equations that are difficult for the average person to understand or use. ADEQ calculated the criteria for a range of hardness and pH values and presented the calculated criteria in a series of tables to make the standards more understandable and “user-friendly.”
- c. ADEQ repealed the current aquatic and wildlife chronic toxicity criteria that are established for ephemeral waters.
- d. ADEQ revised the numeric water quality criteria for the partial-body contact designated use. ADEQ used a modified FBC methodology to derive water quality criteria for PBC.
- e. ADEQ updated the human health and aquatic and wildlife criteria in Appendix A using current human health effects (that is, updated reference doses and cancer potency slopes) and toxicity data.
- f. ADEQ updated the aquatic life criteria for ammonia for A&Wc and A&Ww to be consistent with EPA’s 1999 Update of the Ambient Water Quality Criteria for Ammonia.

21. Revisions to Appendix B:

- a. ADEQ revised the aquatic and wildlife designated uses for A&W (cold water) and A&W (warm water) using the 5000 foot elevation as a predictive model for aquatic life use designation. Research conducted by ADEQ’s biocriteria program shows that perennial streams above 5000 feet in elevation generally have cold water macroinvertebrate communities and those that are below 5000 feet in elevation generally have warm water macroinvertebrate communities. ADEQ used this information to refine the current A&Wc and A&Ww use designations for surface waters listed in Appendix B. Many surface waters listed in Appendix B were segmented at or near the 5000 foot elevation and appropriate A&Wc or A&Ww designated uses were established.
- b. ADEQ revised location descriptions of many surface waters listed in Appendix B to be more specific using latitudes and longitudes.
- c. ADEQ added Tempe Town Lake and established the FBC, A&Ww, and FC designated uses for it in Appendix B.
- d. ADEQ revised the designated uses for Davidson Canyon in Pima County. ADEQ made other changes to designated uses of other streams in Pima County based upon information provided by the Pima Association of Governments in the *Sonoran Desert Conservation Plan, GIS Coverage of Perennial Streams, Intermittent Streams, and Areas of Shallow Groundwater, Final Project Report*, January, 2000.
- e. ADEQ added the domestic water source (DWS) designated use to Canyon Lake in the Salt River basin and Lake Pleasant in the Middle Gila River basin.
- f. ADEQ reviewed surface waters with the partial-body contact recreation (PBC) designated use to determine if there is any new information that indicates that the full-body contact recreation (FBC) designated use is an attainable use.

Each of these issues is discussed in more detail in the following sections of the preamble. The discussion of issues in the preamble is organized by the numeric order of the surface water quality standards rules, starting with issues related to definitions in R18-11-101 and ending with issues related to the list of surface waters and their designated uses in Appendix B.

Definitions [R18-11-101]

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The terms that are used in the surface water quality standards rules are defined in R18-11-101. ADEQ revised the current definitions for “aquatic and wildlife (cold water fishery),” “aquatic and wildlife (warm water fishery),” “ephemeral water,” and “effluent dependent water.” ADEQ also added new definitions for “perennial surface water,” “intermittent surface water,” and “pollutant.”

Revision of the definitions of aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery)

ADEQ changed the definitions of “aquatic and wildlife (cold water fishery)” (“A&Wc”) and “aquatic and wildlife (warm water fishery)” (“A&Ww”) to “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water)” respectively. The current definition of “aquatic and wildlife (cold water fishery)” is:

Aquatic and wildlife (cold water fishery) means the use of a surface water by animals, plants, or other organisms, including salmonids, for habitation, growth, or propagation. [See R18-11-101(7)]

The current definition of “aquatic and wildlife (warm water fishery)” is similar:

Aquatic and wildlife (warm water fishery) means the use of a surface water by animals, plants, or other organisms, excluding salmonids, for habitation, growth, or propagation. [See R18-11-101(10)]

Both aquatic life designated uses are defined by the presence or absence of salmonid species (for example, trout). The use of the presence or absence of salmonids to define the A&Wc and A&Ww aquatic life designated uses is problematic for two reasons. First, not all cold surface waters contain salmonids but they do contain aquatic life that should be protected by A&Wc standards. Second, statewide data on the distribution of salmonid species in Arizona surface waters is lacking. ADEQ has relied on data supplied by the Arizona Game and Fish Department, the U.S. Fish and Wildlife Service, or anecdotal data to support the current A&Wc and A&Ww use designations. For many surface waters, it is not known whether salmonids are or are not present.

Research conducted by the ADEQ biocriteria program on the distribution of bottom-dwelling aquatic invertebrates (that is, benthic macroinvertebrates) in Wadeable, Perennial streams indicates that benthic macroinvertebrate communities are a better indicator of whether A&Wc or A&Ww water quality standards should apply to a surface water [See Spindler, Patti, “Macroinvertebrate Community Distribution Among Reference Sites in Arizona,” Open File Report 00-05, Biocriteria Program, Arizona Department of Environmental Quality, October, 2000].

The findings of the report cited above are based on benthic macroinvertebrate data collected over 3 years at 89 reference sites statewide. 329 different taxa were collected in 240 bioassessments. Community patterns among the 89 reference sites were described using three multi-variate statistical methods: 1) de-trended correspondence analysis, 2) cluster analysis, and 3) discriminant function analysis. Statistical analyses of the bioassessment data resulted in the identification of two broad macroinvertebrate community types in Arizona. 59 environmental variables were included initially in the correlation analysis. Pearson correlations were performed on the initial set of 59 environmental variables to find the most important environmental variables explaining macroinvertebrate community distribution. 14 variables were selected for inclusion in multiple regression and discriminant function analyses. Elevation was consistently identified as the most important environmental variable explaining the distribution of the two community types. ADEQ found that a warm water macroinvertebrate community inhabits Wadeable, Perennial streams in Arizona that are at elevations of 5000 feet or less. A cold water macroinvertebrate community inhabits Wadeable, Perennial streams that are at elevations of 5000 feet or more.

Unique characteristics of each macroinvertebrate community, called metrics, describe the structure and function of the warm water and cold water macroinvertebrate communities. ADEQ has found through its biocriteria program research that the warm water macroinvertebrate community contains fewer taxa of pollution-sensitive mayflies and caddisflies, has fewer taxa overall, contains fewer “scraper” taxa, almost non-existent “shredder” abundance, and greater composition in the stream by the dominant taxon. The warm water macroinvertebrate community is uniquely adapted to floods and droughts in Arizona’s arid landscape and consists of a resilient community that is taxonomically poorer than the cold water community. The cold water macroinvertebrate community is taxonomically richer and resembles benthic macroinvertebrate communities found in Rocky Mountain streams of other western states. The cold water macroinvertebrate community is richer in pollution sensitive mayflies and caddisflies, has greater overall taxa richness, more abundant “shredders,” contains more “scraper” taxa, and reduced composition by the most dominant taxon. All small- to medium-sized perennial streams in the state are predicted to be one of these two general macroinvertebrate community types.

The macroinvertebrate community is a better indicator of the A&Wc and A&Ww designated uses than the presence or absence of salmonids because: 1) All perennial surface waters contain benthic macroinvertebrates, and 2) ADEQ now has collected data statewide on the distribution of benthic macroinvertebrates in Wadeable, Perennial streams. Statistical analyses of data collected by the ADEQ biocriteria program show that there are identifiable differences between the benthic macroinvertebrate communities of cold and warm water streams. The data also show that there is a transition from cold water to warm water macroinvertebrate communities at approximately the 5000 foot elevation.

ADEQ proposes to use the results of this research to refine the A&Wc and A&Ww designated uses in the state. ADEQ believes that the use of macroinvertebrate communities is a more scientifically defensible way to assign the A&Wc and A&Ww designated uses than data on the presence or absence of salmonids. ADEQ proposes to change the name of “aquatic and wildlife (cold water fishery)” to “aquatic and wildlife (cold water).” The purpose of this

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change is to clarify that the A&Wc designated use applies to surface waters that support fish populations and also to those that do not support fish populations. The proposed rule defines “aquatic and wildlife (cold water)” as follows:

“Aquatic and wildlife (cold water)” means the use of a surface water by animals, plants, or other cold water organisms, generally occurring at elevations greater than 5000 feet, for habitation, growth, or propagation.

ADEQ made similar changes to the definition of the “aquatic and wildlife (warm water fishery)” designated use. ADEQ changed the name of the designated use to “aquatic and wildlife (warm water)” to clarify that the designated use is not limited to surface waters that support fisheries. The designated use also applies to surface waters that do not support fish populations. ADEQ proposes to define “aquatic and wildlife (warm water)” as follows:

“Aquatic and wildlife (warm water)” means the use of a surface water by animals, plants, or other warm water organisms, generally occurring at elevations less than 5000 feet, for habitation, growth, or propagation.

Revision of the definition of “effluent-dependent water”

ADEQ changed the definition of “effluent-dependent water” (EDW) at R18-11-101(21). The current definition states that an EDW is “a surface water that consists *primarily* of discharges of treated wastewater which has been classified as an effluent dependent water by the Director under R18-11-113.” The word, “primarily,” in this definition is vague. It is not clear from the definition whether a surface water can be classified as an EDW if more than 50% of the flow in a surface water consists of treated wastewater (that is, the flow consists *primarily* of discharges of treated wastewater). ADEQ revised the definition of “effluent-dependent water” to clarify that an EDW is a surface water whose flow consists of treated wastewater. First, ADEQ removed “primarily” and defined an EDW as a surface water that consists of discharges of treated wastewater. Second, ADEQ added new language to clarify that an EDW is an ephemeral water in the absence of the discharge of treated wastewater. An ephemeral water is defined as a surface water that has a channel that is above the water table at all times and that flows in direct response to precipitation [See R18-11-101(22)]. An EDW normally consists of discharges of treated wastewater. However, an EDW may sometimes contain flow from storm water runoff that is in direct response to precipitation.

ADEQ wants to clarify that an intermittent or perennial surface water with an existing A&Wc or A&Ww aquatic life designated use cannot be re-classified as A&Wedw through the EDW classification process. A wastewater treatment plant that discharges treated wastewater to an intermittent or perennial surface water with an A&Wc or A&Ww designated use must comply with the applicable water quality standards that apply to the receiving water, even where the resulting flow in the receiving surface water consists “primarily” of treated wastewater. ADEQ wants to clarify that a surface water can be classified as an EDW only when the receiving surface water would be an ephemeral water in the absence of the discharge of treated wastewater. ADEQ proposes to define “effluent-dependent water” as follows:

21. “Effluent-dependent water” means a surface water that consists ~~primarily~~ of discharges of treated wastewater ~~which has been that is~~ classified as an effluent-dependent water by the Director under R18-11-113. An effluent-dependent water is a surface water that, without the discharge of treated wastewater, would be an ephemeral water.

The change in the definition of “effluent-dependent water” does not have retroactive effect. The change will have no effect on EDWs classified by the Director before the effective date of the revised definition.

Addition of definitions for “perennial surface water” and “intermittent surface water”

ADEQ added new definitions for “perennial surface water” and “intermittent surface water.” ADEQ added definitions for these terms to support other revisions to the tributary rule and to distinguish intermittent waters from ephemeral waters. As discussed elsewhere in this preamble, ADEQ revised the tributary rule at R18-11-105 to establish water quality standards for unlisted tributaries depending on whether they are: 1) ephemeral waters, 2) perennial and intermittent surface waters above 5000 feet in elevation, or 3) perennial and intermittent surface waters below 5000 feet in elevation. The new definitions for “perennial surface water” and “intermittent surface water” clarify the scope of the revisions to the tributary rule and make the rule more concise and understandable.

ADEQ defined “perennial surface water” as “a surface water that flows continuously throughout the year.” This definition is based upon the generally accepted hydrologic definition of “perennial stream” found in standard references such as: Bates, Robert L. And Jackson, Julia A., Editors, Glossary of Geology, Third Edition, American Geological Institute, Alexandria, Virginia, 1987, p. 492 and W.B. Langbein and Kathleen T. Iseri, “General Introduction and Hydrologic Definitions,” Manual of Hydrology: Part 1. General Surface-Water Techniques, Geological Survey Water Supply Paper 1541-A, United States Government Printing Office, Washington, D.C. (1960), p. 18.

ADEQ defined “intermittent surface water” as a surface water that flows continuously for 30 days or more at times of the year when it receives water from springs or from a surface source such as melting snow. An intermittent surface water is different from an ephemeral water. An ephemeral water flows only in direct response to precipitation (that is, direct storm water runoff) for short periods of time. An intermittent water may flow seasonally for longer periods of time (30 days or more).

The distinction between ephemeral waters and intermittent waters is important because the revised tributary rule assigns different aquatic life designated uses to ephemeral waters and intermittent surface waters. An intermittent surface water has either an A&Wc or A&Ww designated use with acute and chronic toxicity criteria to protect aquatic

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life. An intermittent water has the same aquatic life designated uses as a perennial surface water. Ephemeral waters are protected by a subcategory of the aquatic life designated use that is specifically tailored for ephemeral waters. The aquatic and wildlife (ephemeral) designated use does not include chronic toxicity criteria because of the short duration of flow in an ephemeral water.

Amendment of the definition of “ephemeral water”

The current surface water quality standards rules define “ephemeral water” as a “surface water that has a channel that is at all times above the water table, that flows only in direct response to precipitation, *and that does not support a self-sustaining fish population*” (emphasis added) [See R18-11-101(22)]. The current definition is inconsistent with generally accepted hydrologic definitions of “ephemeral water” found in reference texts such as the Glossary of Geology and the USGS Manual of Hydrology cited above. The standard definitions of “ephemeral water” do not include a biological element that refers to the non-support of a self-sustaining fish population. The reference texts define “ephemeral water” as a surface water that flows only in direct response to precipitation and whose channel is at all times above the water table. The term is sometimes restricted to mean a stream that does not flow during periods of as much as 30 days. Ephemeral waters are distinguished from intermittent waters because an intermittent water is a surface water that flows continuously for 30 days or more at times of the year when it receives water from springs or from another surface source such as melting snow. ADEQ repealed the biological element in the current definition of “ephemeral water” that refers to fish populations to make the definition more concise and more consistent with the generally accepted hydrologic definition of “ephemeral water.” The amended definition of “ephemeral water” in the proposed rule states:

22. “Ephemeral water” means a surface water that has a channel that is at all times above the water table and that flows only in direct response to precipitation ~~and that does not support a self-sustaining fish population.~~

Addition of a definition for “pollutant.”

The word, “pollutant,” is used in several places in the current surface water quality standards rules but it is not defined in the rules. For example, the current antidegradation rule states at R18-11-107(A) that ADEQ shall determine whether there is degradation of surface water quality on a “pollutant by pollutant” basis. The narrative standards rule states at R18-11-108(A) that a surface water shall be free from pollutants in amounts or combinations that cause various effects [See R18-11-108(A)(1-8)]. A definition of “pollutant” will clarify the rules where “pollutant” is used and make the rules more understandable.

ADEQ incorporated the statutory definition of “pollutant” from Arizona’s water quality control statutes into the surface water quality standards rules. The statutory definition of “pollutant” at A.R.S. § 49-201(28) is broadly inclusive and goes beyond chemical pollutants. In particular, the statutory definition clearly includes rock, sand, and dirt as “pollutants.” The inclusion of rock, sand, and dirt in the statutory definition of “pollutant” is important because it clarifies that excessive sediment in a surface water may be considered a pollutant. ADEQ proposes to include the definition of “pollutant” prescribed in Arizona’s Water Quality Control statutes in the surface water quality standards rules. A.R.S. § 49-201(28) defines “pollutant” as follows:

“Pollutant” means fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid waste, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and mining, industrial, municipal and agricultural wastes or any other liquid, solid, gaseous, or hazardous substance.

Applicability [R18-11-102]

The water quality standards in Title 18, Chapter 11, Article 1 of the Arizona Administrative Code apply to surface waters in Arizona [See R18-11-102(A)]. In general, “surface water” includes Arizona’s rivers, streams, and lakes. The term, “surface water,” has a specific legal definition for purposes of the water quality standards program [See R18-11-101(40) of the current rules]. In general, “surface water,” as used in the surface water quality standards rules, has the same meaning as the terms, “navigable water” and “water of the United States,” as those terms are used in the Clean Water Act and its implementing federal regulations.

§ 303(c) of the Clean Water Act requires states to adopt water quality standards for “navigable waters.” The term, “navigable waters,” is somewhat misleading. It does *not* mean a water body that can be navigated by boat. “Navigable waters” has a specific legal definition in the Clean Water Act. The Clean Water Act defines “navigable waters” as the “waters of the United States” [See § 402(7) of the Clean Water Act [33 U.S.C. 1362(7)]]. Congress did not define “waters of the United States” in the Clean Water Act. However, EPA has defined “waters of the United States” in federal regulations that implement the Act, such as the federal regulations that govern the NPDES permit program [See 40 CFR § 122.2].

Under 40 CFR § 122.2, “waters of the United States” means:

- a. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- b. All interstate waters, including interstate “wetlands;”

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- c. All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, or playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such waters:
 - 1. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - 2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - 3. Which are used or could be used for industrial purposes by industries in interstate commerce;
- d. All impoundments of waters otherwise defined as waters of the United States under this definition;
- e. Tributaries of waters identified in paragraphs (a) through (d) of this definition;
- f. The territorial sea; and
- g. “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

ADEQ modeled the state’s definition of “surface water” on the above definition. The federal definition of “waters of the United States” in 40 CFR § 122.2 is essentially the same as the state’s definition of “surface water.” ADEQ defines “surface water” at R18-11-101(43) as follows:

“Surface water” means a water of the United States and includes the following:

- a. A water that is currently used, was used in the past, or may be susceptible to use in interstate or foreign commerce;
- b. An interstate water, including an interstate wetland;
- c. All other waters, such as an intrastate lake, reservoir, natural pond, river, stream (including an intermittent or ephemeral stream), creek, wash, draw, mudflat, sandflat, wetland, slough, backwater, prairie pothole, wet meadow, or playa lake, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such water:
 - i. That is or could be used by interstate or foreign travelers for recreational or other purposes;
 - ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - iii. That is used or could be used for industrial purposes by industries in interstate commerce;
- d. An impoundment of a surface water as defined by this definition;
 - i. A tributary of a surface water identified in paragraphs (a) through (d) of this definition; and
 - ii. A wetland adjacent to a surface water identified in paragraphs (a) through (e) of this definition.

There are minor differences between the federal definition of “waters of the United States” and ADEQ’s definition of “surface water” [*Compare* 40 CFR § 122.2 and R18-11-101(43) above]. First, ADEQ’s definition of “surface water” does not include references to the territorial sea or to waters that are subject to the ebb and flow of the tide because Arizona is an inland state and such references are unnecessary. Second, ADEQ’s definition of “surface water” includes examples of intrastate waters that are found in Arizona but are not included as examples in the federal definition of “waters of the United States.” For example, the ADEQ definition of “surface water” includes reservoirs, creeks, ephemeral waters, washes, draws, and backwaters as examples of intrastate waters. These examples are not found in 40 CFR § 122.2.

The purpose of the applicability rule is to clarify the scope of the surface water quality standards. The surface water quality standards apply to “surface waters” as defined by R18-11-101(43). Put another way, the surface water quality standards apply to “navigable waters” as defined in the Clean Water Act. That is, they apply to “waters of the United States.”

The applicability rule includes two exclusions. Surface water quality standards do *not* apply to waste treatment systems or to man-made surface impoundments and associated ditches and conveyances that are used in the extraction, beneficiation, and processing of metallic ores under certain conditions [*See* R18-11-102(B)]. While ADEQ considered changes to the language of the mining impoundments exclusion in preliminary drafts of the surface water quality standards rules, ADEQ did *not* make substantive changes to the current exclusions in the final rules. The only changes ADEQ made to the applicability rule in this triennial review were editorial changes to delete the unnecessary word, “all,” before “surface waters” in subsection (A) and to change plural nouns to singular nouns in subsection (B).

Designated uses [R18-11-104]

§ 303(c)(2)(A) of the Clean Water Act defines a water quality standard as the designated uses of a surface water and the water quality criteria necessary to support the designated uses. A designated use is one of the two essential elements of a water quality standard. Arizona’s numeric surface water quality standards are expressed in terms of the maintenance and protection of designated uses.

As noted previously, § 303 of the Clean Water Act [33 U.S.C. § 1313(c)(2)(A)] requires states to adopt water quality standards to protect public health or welfare, enhance the quality of water, and “serve the purposes of the Clean Water Act.” 40 CFR § 131.2 and Section 2.1 of the *Water Quality Standards Handbook, 2nd Edition* (p. 2-1) provide guidance on what is meant by the phrase, “serve the purposes of the Clean Water Act.” According to the *Water Quality Standards Handbook*, “serve the purposes of the Act” means that the surface water quality standards should:

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- Provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water (to implement the “fishable and swimmable” goal of the Act), and
- Consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture, and industrial purposes, including navigation.

§ 303 of the Clean Water Act and a similar Arizona statute, A.R.S. § 49-222(A), describe the types of uses of surface waters that must be protected by water quality standards. These uses are called “designated uses.” The Clean Water Act requirements for designated uses are stated in the federal water quality standards regulations at 40 CFR § 131.10(a):

Each state must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.

ADEQ has discretion to adopt a designated use classification scheme appropriate for surface waters in Arizona. However, ADEQ must adopt designated uses that are consistent with the Clean Water Act and the statutory guidelines prescribed in A.R.S. § 49-221 and A.R.S. § 49-222. This means that ADEQ must establish water quality standards that provide water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water where those uses are attainable to be consistent with the “fishable, swimmable” goal of the Clean Water Act. ADEQ also must consider the types of uses described in the Clean Water Act and the Arizona statutes when establishing designated uses for surface waters in Arizona. ADEQ is free to add other designated uses to the state water quality standards except for waste assimilation or transport.

ADEQ has established the following designated uses for surface waters in Arizona:

- Domestic water source (DWS)
- Full-body contact recreation (FBC)
- Partial-body contact recreation (PBC)
- Fish consumption (FC)
- Agricultural irrigation (AgI)
- Agricultural livestock watering (AgL)
- Aquatic life and wildlife (cold water) (A&Wc)
- Aquatic life and wildlife (warm water) (A&Ww)
- Aquatic life and wildlife (effluent-dependent water) (A&Wedw)
- Aquatic life and wildlife (ephemeral water) (A&We)

Arizona’s “menu” of designated uses is listed in R18-11-104(B). Designated uses for specific surface waters are listed in Appendix B of the surface water quality standards rules. The state’s current designated use classification system “serves the purposes of the Clean Water Act” because it provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water.

Federal water quality standards regulations provide states with the authority to adopt subcategories of a use and set appropriate criteria to meet the water quality requirements for each subcategory [See 40 CFR § 131.10(c)]. ADEQ established four subcategories of designated uses to protect fish, shellfish, and wildlife (A&Wc, A&Ww, A&Wedw, and A&We). Every surface water in Arizona, with the exception of certain canals, has one of these four designated uses to protect aquatic life and wildlife.

ADEQ protects water quality for “recreation in and on the water” with the full-body contact recreation (FBC), partial-body contact recreation (PBC), and fish consumption (FC) designated uses. These designated uses are intended to maintain and protect water quality for swimming, water-skiing, boating, wading, fishing, and other recreational uses. The FBC designated use is intended to protect public health when people engage in recreational activities that may involve full immersion in the water and potential ingestion of the water such as swimming. The PBC designated use is intended to protect public health when people engage in water-based recreational activities where full immersion and ingestion of the water are unlikely such as wading or boating. The FC designated use is intended to protect human health when fish or other aquatic organisms are taken from a surface water for human consumption.

ADEQ has considered the use and value of surface waters for public water supply by establishing the domestic water source (DWS) designated use. The DWS designated use applies to a surface water that is used as a raw water source for drinking water supply. The water quality criteria for the DWS designated use were developed assuming that treatment is necessary to yield drinking water suitable for human consumption. The DWS designated use applies to a surface water that has a water treatment plant located along it which uses the surface water as a raw water source.

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Finally, ADEQ recognizes the use and value of surface waters for agricultural purposes by establishing the agricultural irrigation (AgI) and agricultural livestock watering (AgL) designated uses. These uses are intended to maintain and protect surface water quality so water can be used for crop irrigation or to water cattle and other livestock.

Use attainability

In each triennial review, ADEQ considers appropriate revisions to the designated uses of the state's surface waters. The Clean Water Act and its implementing regulations require that ADEQ review the designated uses of the state's surface waters to determine whether the uses that are specified in § 101(a)(2) of the Clean Water Act (that is, the uses related to the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water) are attainable. The *Water Quality Standards Handbook, 2nd Edition* and 40 CFR § 131.10(d) both define "attainable uses" as uses that can be achieved by imposition of effluent limits required under §§ 301(b)(1)(A) and (B) [33 U.S.C. 1311(b)(1)(A) and (B)] and § 306 [33 U.S.C. § 1316] on point source dischargers and implementation of cost-effective and reasonable best management practices for nonpoint source pollution control.

Federal law requires that ADEQ re-examine each surface water with surface water quality standards that do not include the uses specified in § 101(a)(2) of the Clean Water Act each triennial review to determine if there is new information indicating that the uses specified in § 101(a)(2) are attainable. If "fishable, swimmable" uses are attainable in a surface water, ADEQ must revise the state-adopted water quality standards accordingly [See 40 CFR § 131.20(a)].

ADEQ interprets the uses that are specified in § 101(a)(2) of the Clean Water Act [33 U.S.C. § 1251(a)(2)] to include one of the state's four aquatic life use subcategories (A&Wc, A&Ww, A&Wedw, or A&We) (the uses related to the protection of fish, shellfish, and wildlife), the full-body contact recreation designated use (that is, the "swimmable" use), and the fish consumption designated use (that is, the "fishable" use). Therefore, ADEQ must review each surface water listed in Appendix B of the surface water quality standards rules each triennial review and re-examine surface waters that do not include a FBC, FC, and an A&W designated use. Under 40 CFR § 131.10(j), ADEQ must conduct a use attainability analysis (UAA) to justify the omission of one of these designated uses. EPA has stated in the preamble to the federal water quality standards regulations that a state need only conduct a UAA once for a given water body and a set of designated uses [48 Federal Register, 51,400, 51,409 (November 8, 1983)]. During subsequent triennial reviews, a state is required only to review the bases for not including a use that is specified in § 101(a)(2) of the Clean Water Act to show that circumstances have not changed and that the FBC, FC, or A&W designated use remains unattainable.

There are six grounds that can be used to demonstrate that attaining a designated use is not feasible. The six grounds are prescribed in 40 CFR § 131.10(g) and R18-11-104 (H)(1-6). They are:

1. Naturally occurring pollutant concentrations prevent the attainment of the use;
2. Natural, ephemeral, intermittent, or low flow conditions prevent the attainment of the use;
3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;
4. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use;
5. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life designated uses; or
6. Controls more stringent than those required by § 301(b) and § 306 of the Clean Water Act are necessary to attain the use and implementation of such controls would result in substantial and widespread economic and social impact.

When ADEQ conducts a triennial review of the state's surface water quality standards rules, ADEQ must evaluate what uses are being attained in surface waters. If a surface water is designated for a use that requires less stringent criteria than a use that is being attained, ADEQ must revise the designated uses to include the use that is actually being attained. For example, if a surface water has a PBC designated use but it is actually used for full-body contact recreation or the existing water quality in the surface water meets FBC water quality standards, then ADEQ must revise the list of designated uses for that surface water to include the FBC designated use.

ADEQ Review of Surface Waters in Appendix B That Lack a Full-body Contact Recreation Designated Use

Every surface water in Arizona, with the exception of certain canals, has either a full-body contact recreation (FBC) or a partial-body contact recreation (PBC) designated use. ADEQ interprets the Clean Water Act and the federal water quality standards regulations as requiring a review of each surface water with a PBC designated use to determine if the FBC designated use is attainable.

The large majority of surface waters with a PBC designated use are identified as ephemeral waters, effluent-dependent waters, or municipal park lakes. In 1996, ADEQ prepared use attainability analyses to justify the omission of the FBC designated use for ephemeral and effluent-dependent waters. These UAAs were approved by EPA. EPA has stated in the preamble to the federal water quality standards regulation that a state need only conduct a UAA once for

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a given water body and a set of designated uses [48 Federal Register 51,400, 51,409 (November 8, 1983)]. During subsequent triennial reviews, a state is required only to review the bases for not including a use that is specified in § 101(a)(2) of the Clean Water Act to show that circumstances have not changed and that the FBC designated use remains unattainable. ADEQ will rely on the previously submitted UAAs for ephemeral and effluent-dependent waters to justify the

omission of the FBC designated use because circumstances have not changed and the FBC designated use remains unattainable in both ephemeral and effluent-dependent waters.

ADEQ reviewed the following surface waters in this triennial review to determine if there is any new information warranting a change in the water quality standards and that indicated that FBC was an attainable use:

1. Dry Lake in the Little Colorado River basin is currently classified as an EDW but it does not have a PBC or a FBC designated use. ADEQ added a PBC designated use.
2. Indian Bend Wash in the Middle Gila River basin currently does not have an FBC designated use, it has the A&Ww and PBC designated uses. ADEQ revised the A&Ww designated use to A&We because Indian Bend Wash is an ephemeral water.
3. Mule Gulch in the Rios de Mexico basin, from the headwaters to the Bisbee WWTP outfall is identified currently as having the A&Ww and PBC designated uses. ADEQ divided Mule Gulch from its headwaters to the Bisbee WWTP into two segments. The upper segment from the headwaters to just above the Lavender Pit has the designated uses of A&Ww and PBC. The lower segment from Lavender Pit to the Bisbee WWTP is an ephemeral water with the designated uses of A&We and PBC. The PBC designated use is appropriate for both segments of Mule Gulch because Mule Gulch is either an ephemeral water or low flow prevents the attainment of the FBC designated use.
4. Salt River, in the Salt River basin, from the I-10 bridge to the 23rd Avenue WWTP outfall is identified currently as A&Ww with a PBC designated use. ADEQ reviewed the bases for both the A&Ww and PBC designated uses for this reach of the Salt River. ADEQ has determined that this reach of the Salt River is normally a dry watercourse that flows only in direct response to storm events. ADEQ designated this reach of the Salt River as A&We and PBC.
5. Bitter Creek, in the Verde River basin, from the headwaters to the Jerome WWTP outfall discharge currently has the A&Ww and PBC designated uses. ADEQ reviewed this surface water to determine whether the FBC designated use was an attainable use. ADEQ found that Bitter Creek from its headwaters to the Jerome WWTP outfall is an ephemeral water. The appropriate designated uses for this reach of Bitter Creek are A&We and PBC.

A number of municipal park lakes identified in Appendix B do not have a FBC designated use because full-body contact recreation is prohibited by local ordinances.

ADEQ Review of Surface Waters That Lack a Fish Consumption Designated Use

As noted above, ADEQ interprets the uses that are specified in § 101(a)(2) of the Clean Water Act to include the fish consumption (FC) designated use. The FC designated use is one that ADEQ interprets to be within the meaning of the phrase, "recreation in and on the water." In each triennial review, ADEQ must review each surface water that does not include the FC designated use to determine whether the FC designated use is attainable. ADEQ must justify the omission of the FC designated use for a surface water with a use attainability analysis (UAA).

With one exception, the FC designated use has been established for every perennial surface water in Arizona that currently has either an aquatic and wildlife (cold water) or aquatic and wildlife (warm water) designated use. The one exception is Nogales Wash. Nogales Wash has an aquatic and wildlife (warm water) designated use but it does not have a FC designated use. In 1996, ADEQ prepared a UAA to justify the omission of the FC designated use in Nogales Wash [See "Fish Consumption in Nogales Wash: Use Attainability Analysis (April 3, 1996)"]. This UAA was based on the following grounds: 1) natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the FC designated use, and 2) human-caused conditions or sources of pollutants prevent the attainment of FC designated use and cannot be remedied or would cause more environmental damage to correct than to leave in place. Circumstances have not changed in Nogales Wash and ADEQ will resubmit the 1996 UAA documentation to justify the omission of the FC designated use in Nogales Wash in this triennial review.

Fish consumption has not been established as a designated use for surface waters that fall into two general categories: 1) ephemeral waters, and 2) effluent-dependent waters. ADEQ prepared UAAs in the 1996 triennial review to justify the omission of the FC designated use in ephemeral waters and effluent-dependent waters [See "Use Attainability Analyses: Non-Attainment of Full-body Contact for Surface Waters and Non-Attainment of Fish Consumption for Ephemeral Waters" (March 17, 1997) and "Fish Consumption in Effluent-Dependent Waters: Use Attainability Analysis (April 3, 1996)"]. Again, circumstances have not changed for these categories of surface waters and ADEQ will resubmit the UAAs that were previously prepared to justify the omission of the FC designated use in ephemeral waters and EDWs to EPA.

Finally, fish consumption has not been established as a designated use for the canals that are listed in the surface water quality standards rules. The few canal systems that are listed in the surface water quality standards rules are manmade conveyances for the transportation of surface water for domestic water supply and agricultural uses. Listed canals may have limited recreational uses. For example, the banks of Phoenix area canals are open to the public and they are used as popular recreation areas (for example, walking, jogging, and bicycling). However, fishing in the

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canals is prohibited. ADEQ cannot say that no one in the Phoenix metropolitan area has ever fished in a canal since the passage of the Clean Water Act and its implementing regulations. However, incidental and prohibited fishing should not support a finding that fish consumption is an existing use. Water in the canals is used for domestic water supply and agricultural irrigation. For this reason, ADEQ will not establish fish consumption as a designated use for canals in this triennial review.

ADEQ Review of Surface Waters That Lack an Aquatic and Wildlife Designated Use

Every surface water that is listed in Appendix B of the surface water quality standards rules, with the exception of certain canals, has an aquatic life designated use. The large majority of Arizona surface waters do not lack an aquatic life designated use and they do not have to be re-examined in the triennial review to determine if a designated use related to the protection and propagation of fish, shellfish, and wildlife is attainable.

ADEQ did not propose an aquatic life designated use for canals in this triennial review. As noted above, the few canal systems that are currently listed in the surface water quality standards rules are manmade conveyances whose primary use is the transportation of surface water for domestic water supply and for agricultural uses. Human-caused conditions prevent the attainment of an aquatic life designated use in the listed canals. For example, the Phoenix area canals listed in Appendix B of the water quality standards rules are closed systems that are actively managed and maintained. Each year in the fall and winter, portions of the major Phoenix canals are dried up for up to a month at a time so construction and maintenance activities can be performed. Canal dry-ups by themselves prevent the attainment of an aquatic life designated use. Furthermore, most of the major Phoenix area canals and laterals are lined with a cement-like protective covering to prevent seepage and to minimize water loss. The canals are not “natural” waterways. They are constructed conveyances, that is, essentially concrete-lined ditches and they do not provide adequate habitat to support aquatic life.

Proposed Revisions of the Aquatic and Wildlife (Cold Water Fishery) and Aquatic and Wildlife (Warm Water Fishery) Designated Uses

As discussed previously in the definition section of this preamble, ADEQ revised the current definitions of the aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery) designated uses. Currently, these two designated uses are defined by references to the presence or absence of salmonid species in a surface water. “Aquatic and wildlife (cold water fishery)” means “the use of a surface water by animals, plants, or other organisms, *including salmonids*, for habitation, growth, or propagation” [See R18-11-101(7)]. “Aquatic and wildlife (warm water fishery)” means “the use of a surface water by animals, plants, or other organisms, *excluding salmonids*, for habitation, growth, or propagation” [See R18-11-101(10)].

The references to “fishery” in the current A&Wc and A&Ww designated uses are misnomers. The current names of the designated uses suggest that the water quality standards are intended to apply only to surface waters that actually support fisheries. However, the current definitions of the A&Wc and A&Ww designated uses clearly indicate that the designated uses are intended to have broader application. The A&Wc and A&Ww designated uses are defined in terms of the protection of “animals, plants, or other organisms” and they are not limited to the protection of fish species. The A&Wc and A&Ww designated uses are meant to maintain and protect water quality for aquatic life. Both designated uses apply to surface waters that support fisheries and those that do not have fish. For example, there may be cold or warm water streams that support a diverse assemblage of macroinvertebrates, aquatic plants, and other organisms but they do not support fish species. The A&Wc and A&Ww designated uses are intended to apply to such surface waters. For this reason, ADEQ revised the names of the two designated uses by deleting the reference to “fishery” in each one. The new names of the designated uses in the final rule are: “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water).”

ADEQ also revised the current definitions of the A&Wc and A&Ww designated uses to repeal the references to the presence or absence of salmonids. ADEQ proposes to define the A&Wc and A&Ww designated uses using the macroinvertebrate communities that each type of surface water supports. ADEQ biocriteria program research on the distribution of macroinvertebrate communities in streams in Arizona indicates that macroinvertebrate communities are a better way to define the A&Wc and A&Ww designated uses. Macroinvertebrate communities are a better way to define the A&Wc and A&Ww designated uses for two reasons.

First, virtually all surface waters contain macroinvertebrates. The problem with using the presence or absence of salmonids as the way to define the A&Wc and A&Ww designated uses is that some Arizona surface waters may not contain fish populations or there is little or no data on the presence or absence of salmonids in a surface water to make a reliable determination as to which designated use applies. The lack of data on the presence or absence of salmonids makes it difficult for ADEQ to determine which designated use should apply without conducting an actual field investigation of a surface water.

Second, ADEQ has acquired data on the distribution of macroinvertebrates in surface waters statewide through its biocriteria program [See Spindler, Patti, “Macroinvertebrate Community Distribution Among Reference Sites in Arizona,” Arizona Department of Environmental Quality, October, 2000]. The data from this study show that there are two broad macroinvertebrate community types in Arizona: cold water and warm water macroinvertebrate communities. ADEQ has found through statistical analyses of the macroinvertebrate data that elevation was consistently identified as the most important environmental variable explaining the distribution of the two community types. Cold water macroinvertebrate communities are generally found at elevations greater than 5000 feet and warm water mac-

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roinvertebrate communities are generally found at elevations less than 5000 feet. The data indicate that the 5000 foot elevation contour can be used as a predictive model to determine whether A&Wc or A&Ww should apply to a surface water. ADEQ believes that the use of macroinvertebrate community types and the 5000 foot elevation contour is a more reliable and scientifically defensible way to determine which aquatic life designated use applies to a surface water.

ADEQ revised the listings of surface waters that are currently classified as A&Wc and A&Ww based upon whether a surface water is above or below 5000 feet in elevation. ADEQ classified reaches of perennial surface waters that are above 5000 feet as A&Wc and those that are below 5000 feet in elevation as A&Ww. The use of the 5000 foot elevation contour resulted in changes to the current designated uses for some surface waters in each watershed. In some cases, ADEQ segmented surface waters with upper reaches that start above 5000 feet and lower reaches that terminate below 5000 feet in elevation.

ADEQ recognizes that there may be exceptions to the use of the 5000 foot elevation contour to assign A&Wc and A&Ww designated uses. For example, there may be streams located below 5000 feet that are affected by hypolimnetic releases of very cold water from dams (for example, the Colorado River below Glen Canyon Dam). Also, the use of the 5000 foot elevation contour does not apply to the assignment of aquatic life uses to lakes and reservoirs. ADEQ does not propose to change the current aquatic life designated uses for lakes and reservoirs in this triennial review. A complete listing of proposed changes to the A&Wc and A&Ww designated uses is shown in Appendix B.

Changes to the tributary rule [R18-11-105]

R18-11-105 is commonly called “the tributary rule.” The tributary rule establishes water quality standards for surface waters that are not listed in Appendix B of the surface water quality standards rules. The intent of the rule is to provide a minimum level of water quality protection for all surface waters in Arizona, including the surface waters that are not specifically identified in Appendix B of the rules. The tributary rule accomplishes this by prescribing designated uses and establishing default water quality standards for unlisted tributaries.

The current tributary rule establishes water quality standards for four different types of tributaries: 1) ephemeral waters, 2) effluent-dependent waters (EDWs), 3) tributaries that are neither ephemeral or EDWs and that have salmonids present, and 4) tributaries that are neither ephemeral or EDWs and that do not have salmonids present. Under the current rule, unlisted tributaries that are ephemeral waters are protected by the water quality standards for aquatic and wildlife (ephemeral) and partial-body contact recreation. The aquatic and wildlife (edw) and partial-body contact water quality standards apply to unlisted tributaries that are EDWs. Tributaries that are neither ephemeral waters or EDWs and that have salmonids present are protected by aquatic and wildlife (cold water), fish consumption, and the water quality standards that apply to the nearest downstream surface water that is neither an ephemeral water or an EDW. Tributaries that are neither an ephemeral water or an EDW that do not have salmonids present are protected by aquatic and wildlife (warm water) standards, fish consumption standards, and the water quality standards that apply to the nearest downstream surface water listed in Appendix B that is neither an ephemeral water or an EDW.

The current tributary rule needs to be revised for several reasons. First, the current rule is confusing. Second, the current rule includes a provision that assigns water quality standards to “an unlisted tributary that is an effluent-dependent water” [See R18-11-105 (2)]. This part of the tributary rule is inconsistent with R18-11-113, the rule that specifically addresses EDWs. Under R18-11-113, the only way that a surface water can be recognized as an EDW is when ADEQ promulgates a rule to classify the surface water as an EDW. Consequently, all EDWs in Arizona are specifically listed in R18-11-113(D) and in Appendix B of the surface water quality standards rules. It is impossible for there to be an *unlisted* tributary that is an EDW. Thus, the part of the tributary rule that addresses unlisted tributaries that are EDWs has no practical application. ADEQ repealed R18-11-105(2) in the final rules because it is unnecessary.

Second, the current tributary rule defines two categories of tributaries by the presence or absence of salmonid species [See R18-11-105 (3) and (4)]. These subsections of the tributary rule are consistent with the way that ADEQ currently defines the aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery) designated uses in the surface water quality standards rules. As noted above, ADEQ revised the names and the definitions of the A&Wc and A&Ww designated uses in this triennial review. ADEQ also revised the tributary rule to conform it to the proposed changes in the definitions of the A&Wc and A&Ww designated uses. The revised tributary rule assigns designated uses to unlisted tributaries depending on whether they are ephemeral, intermittent, or perennial streams and whether they are above or below 5000 feet in elevation. The aquatic and wildlife (ephemeral) and partial-body contact designated uses continue to apply to unlisted tributaries that are ephemeral waters. Unlisted tributaries that are intermittent or perennial and above 5000 feet in elevation are assigned the aquatic and wildlife (cold water), full-body contact recreation, and fish consumption water quality standards. Unlisted tributaries that are intermittent or perennial and are below 5000 feet in elevation are assigned the aquatic and wildlife (warm water), full-body contact recreation, and fish consumption standards. The assignment of the FBC, FC, and the A&Wc or A&Ww designated uses to unlisted tributaries that are perennial or intermittent is consistent with the way that ADEQ establishes designated uses for perennial and intermittent surface waters that are listed in Appendix B. Also, this approach is consistent with the “fishable and swimmable” goals of the Clean Water Act.

Finally, the current tributary rule assigns designated uses from the “...nearest downstream surface water listed in Appendix B that is not an ephemeral water or effluent-dependent water” to unlisted tributaries that are neither ephemeral

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eral waters or EDWs [See R18-11-105(3) and (4)]. The original intent of this rule was to ensure compliance with surface water quality standards that apply to the nearest downstream, perennial surface water. ADEQ is concerned that the implementation of this part of the current tributary rule more frequently results in the establishment of inappropriate designated uses for upstream tributaries. In many cases, the nearest downstream, perennial surface water is separated from an unlisted tributary by long stream reaches that are ephemeral waters. Often, the assignment of designated uses such as the domestic water source, agricultural irrigation, or agricultural livestock watering from the nearest downstream surface water to an unlisted tributary is inappropriate because they are not existing uses of the unlisted tributary. Also, the assignment of designated uses to an unlisted tributary is usually unnecessary to maintain and protect water quality in the downstream, perennial surface water because, in most cases, the unlisted tributary and the nearest downstream, perennial surface water are spatially interrupted. Finally, the assignment of “fishable, swimmable” designated uses to unlisted tributaries that are perennial or intermittent through the proposed tributary rule will: 1) provide a high level of water quality protection to the unlisted tributaries, and 2) ensure that water quality in the nearest downstream perennial surface water is maintained and protected.

Revisions to the Antidegradation Rule [R18-11-107]

Arizona’s surface water quality standards rules must include an antidegradation policy that is consistent with the federal antidegradation policy prescribed in 40 CFR § 131.12. Arizona’s antidegradation rule is R18-11-107 and its language closely parallels the language of 40 CFR § 131.12. The antidegradation requirement is based upon the primary objective of the Clean Water Act stated in § 101(a)(2) to “...restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” The degradation of surface water quality is antithetical to this primary objective. The antidegradation concept was specifically included in the text of the Clean Water Act in 1987 in an amendment to § 303(d)(4)(B). § 303(d)(4)(B) requires satisfaction of antidegradation requirements before changes in NPDES permits can be made.

Under 40 CFR § 131.12(a), each state must develop and adopt a statewide antidegradation policy and identify methods for implementing that policy. At a minimum, the state’s antidegradation policy must be consistent with the following:

- Existing instream water uses and the level of water quality necessary to protect existing uses must be maintained and protected [See 40 CFR § 131.12(a)(1)].
- Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the state finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state’s continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control [See 40 CFR § 131.12(a)(2)].
- Where high quality waters constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected [See 40 CFR § 131.12(a)(3)].
- In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with § 316 of the Clean Water Act [See 40 CFR § 131.12(a)(4)].

The state’s current antidegradation rule, R18-11-107, satisfies the federal requirement that ADEQ adopt a statewide antidegradation policy consistent with the federal antidegradation policy prescribed in 40 CFR § 131.12. Both the federal and state antidegradation rules establish a three-tiered approach to maintaining and protecting levels of water quality and the uses of surface waters. Tier 1 establishes the “floor” of water quality protection for surface waters in Arizona. At a minimum, existing uses and the level of water quality necessary to protect existing uses must be maintained and protected. Tier 2 provides for the protection of existing water quality in high quality surface waters or, those surface waters where water quality is better than the levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water. There are provisions in both the federal and state antidegradation rules that allow limited water quality degradation to occur in a Tier 2 surface water provided there is adequate public participation in the decision-making process and water quality is not degraded to a point where a surface water is no longer “fishable, swimmable.” Tier 3 of the federal antidegradation rule provides special water quality protection to surface waters that are classified as outstanding national resource waters. In Arizona, outstanding national resource waters are called “unique waters.” The federal and state Tier 3 antidegradation rules both require the maintenance and protection of existing water quality in an outstanding national resource water or a unique water. Limited activities that result in short-term or temporary changes in water quality are allowable but long-term degradation of existing water quality in a unique water is prohibited. Finally, both the federal and state antidegradation rules have the same language addressing thermal discharges.

There are a few non-substantive differences between the language of 40 CFR § 131.12 and the language of R18-11-107. First, the state antidegradation rule includes an introductory section that clarifies that ADEQ shall determine

whether there is degradation of water quality in a surface water on a “pollutant by pollutant” basis [See R18-11-107(A)]. The “pollutant by pollutant” language is not found in the federal antidegradation policy [Compare 40 CFR § 131.12 and R18-11-107]. Its inclusion in the state rule reflects ADEQ’s understanding of current EPA guidance on how the antidegradation policy should be implemented. ADEQ conducts antidegradation reviews on a pollutant-by-pollutant basis. Thus, a surface water may be considered a Tier 1 waterbody for one pollutant and a Tier 2 waterbody for another pollutant.

ADEQ’s inclusion of the “pollutant by pollutant” language in R18-11-107(A) may have created some misunderstanding in the regulated community that antidegradation reviews are strictly limited to a review of whether degradation by chemical pollutants will occur. While ADEQ does not propose to change the language of R18-11-107(A) in this triennial review, ADEQ wants to clarify that antidegradation determinations are *not* strictly limited to degradation by chemical pollutants only. For example, degradation of water quality in a surface water may occur because of total suspended solids or bottom deposits [i.e. siltation or excessive sedimentation]. The degradation of surface water quality also may be demonstrated by an increase in toxicity as demonstrated by ambient toxicity tests upstream and downstream of a point source discharge. In the latter example, it may not be possible to identify a specific chemical pollutant causing the toxicity through toxicity identification procedures. However, the toxicity test results by themselves could be used to establish that degradation was occurring in a surface water.

Second, the state antidegradation rule includes specific references to surface water quality standards that are not found in 40 CFR § 131.12. The federal Tier 1 antidegradation policy states at 40 CFR § 131.12(a)(1) that “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” Arizona’s Tier 1 antidegradation policy is expressed differently, but it is intended to provide the same level of water quality protection as the federal Tier 1 regulation. Like the federal regulation, R18-11-107(B) states: “The level of water quality necessary to protect existing uses shall be maintained and protected.” However, R18-11-107(B) goes on to clarify that this baseline level of water quality is defined by reference to the surface water quality standards.

R18-11-107(B) states that “[n]o degradation of existing water quality is permitted in a surface water where the existing water quality does not meet the applicable water quality standard.” In other words, the surface water quality standards define the level of water quality necessary to protect existing uses. This clarifying reference to the surface water quality standards is not found in the federal Tier 1 antidegradation policy. Under the Tier 1 policy, existing water quality establishes the water quality “floor” that must be maintained in an impaired surface water when a surface water quality standard is not met. No further degradation of existing water quality with respect to that pollutant is allowed in an impaired surface water.

Third, Arizona’s Tier 2 antidegradation rule uses different language from the Tier 2 language found in 40 CFR § 131.12(a)(2). Again, both rules are intended to accomplish the same purpose. The federal Tier 2 antidegradation policy is intended to protect existing water quality in high quality surface waters. 40 CFR § 131.12(a)(2) states that “[w]here the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected.....” R18-11-107(C) prescribes Arizona’s Tier 2 antidegradation policy for high quality surface waters. R18-11-107(C) provides the same level of antidegradation protection as the federal antidegradation policy, but the state rule expresses the Tier 2 antidegradation policy in terms of existing water quality that is better than applicable surface water quality standards. R18-11-107(C) states that “[w]here existing water quality in a surface water is *better than the applicable water quality standard*, the existing water quality shall be maintained and protected.” In both the federal and state antidegradation policies, the existing high quality of a surface water must be maintained and protected. The existing high quality of the surface water provides the reference point for a Tier 2 antidegradation analysis.

40 CFR § 131.12 and R18-11-107(C) both permit limited degradation of a high quality surface water if certain conditions are met. Under 40 CFR § 131.12(a)(2), lower water quality may be allowed in a Tier 2 surface water provided: 1) lower water quality is necessary to accommodate important economic or social development in the area in which the water is located, 2) the state assures water quality adequate to protect existing uses fully, 3) the state assures that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources, 4) all cost-effective and reasonable best management practices for nonpoint source control are achieved, and 5) the inter-governmental coordination and public participation provisions of the state’s Continuing Planning Process (CPP) are fully satisfied.

R18-11-107(C) closely parallels the language of 40 CFR § 131.12(a)(2). The same conditions must be met under R18-11-107(C) before limited degradation of a high quality surface water is allowed in Arizona. The only difference between the federal and state Tier 2 antidegradation policies is that R18-11-107(C) specifically requires that a public hearing be held on whether limited degradation should be allowed in a Tier 2 surface water. In ADEQ’s view, the public hearing requirement is the equivalent of fully satisfying the intergovernmental coordination and public participation provisions of the state CPP.

Finally, the federal and state antidegradation policies provide special water quality protection for Tier 3 surface waters. Tier 3 surface waters are called “outstanding national resource waters” in the federal antidegradation policy and “unique waters” in the state rule. 40 CFR § 131.12(a)(3) and R18-11-107(D) both require the maintenance and protection of existing water quality in a Tier 3 surface water. However, Arizona’s current Tier 3 antidegradation rule is broader than the federal antidegradation policy because

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R18-11-107(D) extends Tier 3 antidegradation protection to surface waters that are *proposed* for unique waters classification. The federal Tier 3 antidegradation policy requires the maintenance and protection of existing water quality “[w]here high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational and ecological significance....”

R18-11-107(D) requires that existing water quality be maintained and protected in surface waters that are classified as unique waters and in surface waters “that the Director has proposed for classification as a unique water pursuant to R18-11-112.” ADEQ extended Tier 3 antidegradation protection to proposed unique waters in amendments to R18-11-112 that were made in 1992. At the time, ADEQ argued that it was important to extend Tier 3 antidegradation protection to proposed unique waters to assure maintenance and protection of existing water quality and to preserve resource values that led to the nomination of the surface water. By “proposed,” ADEQ meant surface waters that are formally proposed for unique waters classification in a Notice of Proposed Rulemaking. ADEQ made clear that Tier 3 antidegradation protection should be extended to proposed unique waters only after a formal rulemaking process to classify a navigable water as a unique water is initiated by publication of a Notice of Proposed Rulemaking. Tier 3 antidegradation protection did not extend to surface waters that were only nominated for unique waters classification.

ADEQ has reconsidered the extension of Tier 3 antidegradation protection to proposed unique waters. ADEQ revised the final rule to conform Arizona’s Tier 3 policy to be more consistent with federal antidegradation policy. ADEQ repealed the language in the current rule that extends Tier 3 antidegradation protection to surface waters that are *proposed* for unique waters classification.

ADEQ revised R18-11-107(D) as follows:

D. Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as a unique water ~~or that the Director has proposed for classification as a unique water pursuant to under R18-11-112.~~ The Director shall not allow limited degradation of a unique water ~~pursuant to under subsection (C) of this Section.~~

ADEQ repealed the language indicated by strikeouts above for several reasons. First, as noted above, the repeal of the language extending Tier 3 antidegradation protection to proposed unique waters makes the state rule more consistent with federal antidegradation policy, which extends Tier 3 antidegradation protection only to those surface waters that constitute outstanding national resource waters.

Second, it is unclear how the extension of Tier 3 antidegradation protection to a proposed unique water can be practically implemented in the absence of data on existing water quality in a proposed unique water. In most cases, there is little or no data on existing water quality for surface waters that are proposed for unique waters classification. While R18-11-112(C)(4) states that a person who nominates a surface water for unique waters classification must submit *available* water quality data relevant to establishing baseline water quality of the proposed unique water, the rule does not make the collection of water quality data a nomination requirement. ADEQ resource constraints usually preclude the collection of surface water quality data during the pendency of a formal rulemaking proposal.

Third, the extension of Tier 3 antidegradation protection to proposed unique waters only extends Tier 3 antidegradation protection for a relatively short period of time. At most, Tier 3 antidegradation protection is extended six months to one year before it otherwise would apply. As ADEQ made clear in the concise explanatory statement for the surface water quality standards in the 1992 triennial review, Tier 3 antidegradation protection is extended to a proposed unique water only when formal rulemaking to classify that surface water as a unique water is initiated by publication of a Notice of Proposed Rulemaking. Under the State Administrative Procedures Act, the formal rulemaking process usually takes six months to one year to complete after the publication of a Notice of Proposed Rulemaking in the Arizona Administrative Register.

Finally, ADEQ believes that the extension of Tier 3 antidegradation protection to proposed unique waters may create an incentive for persons to nominate surface waters for unique water classification in the hope that Tier 3 antidegradation protection can be obtained for the surface water during the pendency of formal rulemaking procedures. ADEQ is concerned that the extension of Tier 3 antidegradation to *proposed* unique waters is encouraging the nomination of large numbers of surface waters that are believed to be threatened by mining, grazing, timber harvesting, growth and development, or other land uses. The possibility of obtaining Tier 3 antidegradation protection for some interim period combined with the relative ease of nominating surface waters and the broad grounds for unique waters classification in the current rule may explain, at least in part, the large number of nominations in this triennial review (37). The large number of nominations has prompted ADEQ to conduct a complete review of the current unique waters nomination and classification processes in this triennial review. ADEQ proposes to make several changes to the rule governing the unique waters program [See the discussion of R18-11-112 later in this preamble]. One of these changes relates to R18-11-107(D). ADEQ has reconsidered the extension of Tier 3 antidegradation protection to *proposed* unique waters. ADEQ believes that Tier 3 antidegradation protection should be provided to unique waters, but only after the formal rulemaking process is complete and the surface water is recognized as an outstanding state resource water after a full and complete public participation process. The primary benefit of a unique waters classification is Tier 3 antidegradation protection. This benefit should not be afforded to a surface water prior to the development of a complete administrative record through the rulemaking process, including a cost and benefit analysis of a unique waters classification that is required for approval by the Governor’s Regulatory Review Council.

The need for antidegradation implementation procedures

Federal antidegradation policy requires that each state identify methods for implementing its antidegradation policy [See 40 CFR § 131.12(a)]. Antidegradation implementation is basically a set of procedures that are to be followed when evaluating activities that may impact surface water quality. Current EPA guidance on antidegradation in the *Water Quality Standards Handbook (2nd Edition)* states that antidegradation implementation procedures should specify how a state will determine, on a case-by-case basis, whether, and to what extent, surface water quality may be lowered.

Each state's antidegradation implementation procedures are subject to EPA review. However, EPA's review is limited to ensuring that adequate procedures are included that describe how the state will implement the required elements of an antidegradation review. EPA may disapprove and federally promulgate all or part of a state's antidegradation implementation procedures if the procedures can be implemented in a way that, in EPA's judgment, circumvents the basic intent of the federal antidegradation policy [See *Water Quality Standards Handbook, 2nd Edition*, § 4.3].

In 1994, EPA approved the state's antidegradation rule, R18-11-107, with certain conditions. In approving the state antidegradation rule, EPA noted that it had previously requested that Arizona develop antidegradation implementation procedures. EPA stated in an approval letter dated April 29, 1994 that the development of antidegradation implementation procedures was a condition of EPA's previous approval of the antidegradation rule in the 1986 triennial review and was overdue. EPA noted that the U.S. Fish and Wildlife Service determined in its biological opinion of the surface water quality standards rules conducted under § 7 of the Endangered Species Act (ESA) [16 U.S.C. § 1536] that an incidental take of endangered or threatened species could occur because of the lack of state antidegradation implementation procedures. The U.S. Fish and Wildlife Service further determined that the ESA required the state adoption of antidegradation implementation procedures. EPA conditionally approved the antidegradation rule and stated its expectation that ADEQ would develop and adopt antidegradation implementation procedures by 1995.

In 1994, ADEQ staff drafted "Implementation Guidelines for the State of Arizona Antidegradation Standard." This guidance document was based largely on antidegradation implementation procedures that were developed by EPA Region VIII. ADEQ used the Continuing Planning Process (CPP) public participation procedures to develop the antidegradation implementation guidelines because: 1) Each state is required to have a CPP by § 303(e) of the Clean Water Act, and 2) one of the nine required elements of the CPP is a description of "the process for establishing and ensuring adequate implementation of revised or new water quality standards...under § 303(c) of the Act" [See § 303(e)(3)(F) of the Clean Water Act and 40 CFR § 130.5(b)(6)]. Since the antidegradation rule, R18-11-107, is included in the surface water quality standards rules and is a required element of the state's water quality standards submission to EPA, ADEQ thought it was appropriate to develop the antidegradation implementation procedures through the CPP process.

In 1995, ADEQ presented a draft of the state's antidegradation implementation guidelines to the Councils of Governments (COGs) and requested public comments. A few stakeholders provided comments to ADEQ and criticized the use of the CPP public participation process to develop the antidegradation implementation guidelines. In general, the stakeholders who submitted comments to ADEQ were concerned that the use of the CPP public participation process was inadequate because it did not reach major stakeholders in the regulated community who may be directly affected by the state's adoption of antidegradation implementation procedures. This concern was borne out by the relatively few comments that ADEQ received on the antidegradation implementation guidelines as a result of the public meetings held with the COGs. Several stakeholders argued that ADEQ should use the rulemaking process to adopt the antidegradation implementation procedures because rulemaking was, in their view, the only way that ADEQ could ensure that the antidegradation implementation procedures would receive adequate public review.

In the 1996 triennial review, EPA again reviewed and approved ADEQ's revisions to the surface water quality standards rules, including minor revisions to the antidegradation rule. In an EPA approval letter dated December 31, 1998, EPA addressed the issue of antidegradation implementation procedures again and requested that ADEQ provide a schedule for their adoption in the 2000 triennial review. The relevant part of the December 31, 1998 approval letter from EPA states:

The [U.S. Fish and Wildlife] Service has asked that ADEQ provide a schedule for adoption of antidegradation implementation in the Year 2000 triennial review of water quality standards. While the state is long overdue for adoption of antidegradation implementation, it is EPA's understanding that the State has been using the publicly reviewed draft *Implementation Guidelines for the State of Arizona Antidegradation Standard* since 1995. This guidance has been used to implement the antidegradation rule in over 40 permit reviews conducted by ADEQ. As such, the draft implementation document is the *de facto* policy of the State. In the interim, the State is developing a new antidegradation implementation guidance that would more comprehensively analyze water quality; incorporating physical integrity and biological measures to complement the existing approach which is largely based on measures of water chemistry. It is our expectation that the State will complete development and adopt this revised implementation policy for antidegradation during the Year 2000 triennial review. We request that the State provide a schedule for adoption of this implementation guidance.

ADEQ intends to revise the state's antidegradation implementation procedures in 2002. ADEQ had proposed to conduct public participation activities to review the current antidegradation implementation procedures during this triennial review and had hoped to make revisions to the state's antidegradation implementation procedures on the same schedule as the revisions to the surface water quality standards rules. A stakeholder workgroup was formed and sev-

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eral stakeholder group meetings were held to discuss antidegradation implementation procedures. However, the schedule for the development of the antidegradation implementation procedures has fallen behind the triennial review schedule. ADEQ expects to complete the triennial review of surface water quality standards by February, 2002, but ADEQ does *not* expect to complete work on the antidegradation implementation procedures by that date. ADEQ still proposes to use a stakeholder process to ensure full public participation in the development of antidegradation implementation guidelines. However, ADEQ does not expect to initiate the stakeholder process to develop revised implementation guidelines for antidegradation and for narrative standards until after January 1, 2002.

Narrative Water Quality Standards [R18-11-108]

There is a statutory preference in Arizona law for numeric water quality standards if adequate information exists to establish numeric standards [See A.R.S. § 49-221(D)]. However, both federal and state law provide authority for ADEQ to establish narrative water quality standards. The federal water quality standards regulation says that states should establish narrative water quality criteria or criteria based upon biomonitoring methods where numeric criteria cannot be established or to supplement numeric water quality criteria [See 40 CFR § 131.11(b)(2)]. Arizona law also provides authority for ADEQ to adopt narrative water quality standards that “the Director may deem appropriate” [See A.R.S. § 49-221(D)].

ADEQ has used these authorities to promulgate the narrative water quality standards that are found in R18-11-108. Narrative water quality standards supplement the numeric water quality criteria that have been established to maintain and protect water quality for designated uses. Narrative water quality standards also describe the conditions that are necessary to maintain and protect the aesthetic qualities of Arizona’s surface waters. Arizona’s current narrative standards are expressed as nine “free from” statements. R18-11-108 states that Arizona’s surface waters shall be “free from” pollutants in amounts or combinations that:

Settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life or that impair recreational uses;

- Cause objectionable odor in the area in which a surface water is located;
- Cause off-taste or odor in drinking water;
- Cause off-flavor in aquatic organisms or waterfowl;
- Are toxic to humans, animals, plants, or other organisms;
- Cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth, or propagation of other aquatic life or that impair recreational uses;
- Cause or contribute to a violation of an aquifer water quality standard;
- Change the color of the surface water from natural background levels of color.
- Float as debris, foam, or scum; or that cause a film or iridescent appearance on the surface of the water; or that cause a deposit on a shoreline, bank, or aquatic vegetation (The discharge of lubricating oil or gasoline associated with the normal operation of a recreational water craft is not considered to be a violation of this last narrative standard).

ADEQ proposed three revisions to the narrative water quality standards in this triennial review. First, ADEQ proposed to amend the bottom deposits narrative standard to focus it on the protection of aquatic life and to repeal the current reference to the impairment of recreational uses. Second, ADEQ proposed to adopt a new narrative standard to prevent excessive concentrations of suspended solids in a surface water that impair a domestic water source use. Third, ADEQ proposed to amend the narrative standard that addresses undesirable organoleptic effects in aquatic organisms and waterfowl by deleting the reference to “waterfowl.”

Revised narrative standard to prevent siltation and excessive sedimentation

The current surface water quality standards rules include a narrative standard that is intended to prevent harmful effects of bottom deposits on aquatic life and the impairment of recreational uses. R18-11-108(A)(1) states:

A surface water shall be free from pollutants in amounts or combinations that... settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life or that impair recreational uses.

Bottom deposits, or settleable solids, are materials that settle out of suspension from the water column within a given period of time. Excessive sediment deposits can negatively affect aquatic life. Bottom deposits can adversely affect fish by smothering eggs in redds, choking spawning habitats, reducing over-wintering habitat for fry, and by altering invertebrate species composition thereby decreasing the abundance of preferred prey (Cordone and Kelley 1961). Deposited sediments also fill in rearing pools and interstitial spaces of riffles resulting in reduced habitat complexity in stream channels. Bottom deposits fill the interstitial spaces in gravel spawning beds interfering with inter-gravel permeability and transfer of dissolved oxygen thereby reducing the survival of fish eggs and juveniles.

Bottom deposits that blanket stream bottom substrates adversely affect bottom-dwelling aquatic insect (benthic macroinvertebrate) populations as well. Benthic macroinvertebrates are affected by habitat reduction and change resulting in increased drift, lowered respiration capacity through the blocking of gill surfaces or through lowered oxygen concentrations, and the reduced efficiency of feeding activities, especially filter feeding and visual predation (Lemly

1982, Waters 1995). Also, substrate size is important to aquatic insects because it is the primary factor influencing abundance and distribution (Minshall 1984).

Adamus (1995) listed a reduction in species richness and a community shift from herbivorous and filter-feeding species to sediment-burrowing species (worms) as an impairment due to sedimentation in wetlands.

Quantitative approaches for assessing physical integrity and bottom deposits in Arizona's streams are not well understood at the present time. Aggradation, degradation, and the transport of sediment in streams is influenced by many factors including land forms, slopes, soil erodibility, precipitation, runoff, vegetative cover, stream channel and bank erosion, and channel disturbances. The watershed processes that cause adverse sediment impacts are rarely simple and they cannot be reduced to instantaneous measurements of a single indicator such as turbidity. Arizona and several other western states are investigating methods for assessing physical integrity and developing a better understanding of fluvial geomorphic processes using Dave Rosgen's methods of Applied River Morphology. However, easily implementable methods for distinguishing natural from human-caused sedimentation in our streams are not yet available. Through continued research, more quantitative approaches to documenting sedimentation processes may be developed. ADEQ rejects the use of numeric turbidity criteria as a surrogate indicator of excessive sedimentation. Turbidity criteria expressed as single sample maximum concentrations are inappropriate for use in Arizona ecosystems. Therefore, ADEQ is pursuing a narrative approach to address excessive sedimentation and bottom deposits.

As a first step, ADEQ amended the current narrative "bottom deposits" standard to focus the standard on the protection of aquatic life. ADEQ repealed language in the current rule that refers to the impairment of recreational uses as follows:

A surface water shall be free from pollutants in amounts or combinations that... settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life ~~or that impair recreational uses.~~

ADEQ repealed the reference in the narrative standard to the impairment of recreational uses because of the lack of an objective way to determine impairments of recreational use. EPA's national criteria on settleable solids provides no guidance on concentrations of settleable materials that cause impairment of recreational uses [See "Solids (Suspended, Settleable) and Turbidity," *Quality Criteria for Water*, 1986, United States Environmental Protection Agency, Office of Water, Regulations and Standards, Washington, D.C. (May 1, 1986)]. EPA's rationale for its recommended settleable solids criterion discusses adverse effects of settleable materials that damage invertebrate populations, block gravel spawning beds, and remove dissolved oxygen from surface waters. EPA also discusses imbalances in stream biota and reductions in biodiversity that are a result of the deposition of organic materials to bottom sediments. However, there is no discussion in the EPA criteria document for settleable solids that specifically addresses the impairment of recreational uses.

The determination of whether there is an impairment of recreational use is a subjective determination that cannot be consistently implemented. ADEQ does not have practical implementation procedures for determining when bottom deposits impair a recreational use of a surface water. The lack of practical implementation procedures is primarily due to the subjective nature of the recreational use impairment determination. Reasonable persons may differ over the amounts or concentrations of bottom deposits or settleable solids that negatively affect the aesthetic qualities of a surface water to the extent that there is an impairment of a recreational use. What amounts or concentrations of bottom deposits impair the use of a surface water for swimming, fishing, wading, or other water-based recreational activities? For this reason, ADEQ repealed the reference in the "bottom deposits" narrative standard to the impairment of recreational uses.

ADEQ retained the narrative "bottom deposits" standard in the final rule, but amended its language to focus the standard on preventing amounts or concentrations of bottom deposits that impair aquatic life designated uses. ADEQ believes that implementation procedures can be developed for a narrative standard that is intended to protect aquatic life. Implementation procedures can be developed that describe how the bottom deposits narrative standard is applied and how compliance determinations are made.

Implementation guidance for a revised narrative "bottom deposits" standard

The primary purpose of the revised narrative "bottom deposits" standard is to prevent excessive sedimentation and siltation that adversely affect aquatic life in a surface water. For this reason, ADEQ amended the narrative standard to specifically state that surface waters shall be free from pollutants in amounts or combinations that settle to form bottom deposits *that inhibit or prohibit the habitation, growth, or propagation of aquatic life*. The language of the narrative standard directly links bottom deposits to the impairment of aquatic life. This linkage provides a conceptual framework for the development of implementation procedures for determining compliance with the narrative "bottom deposits" standard. The conceptual framework has two basic elements: 1) bioassessment procedures for determining whether there is an impairment of aquatic life, and 2) habitat assessment procedures for determining that the cause of the impairment of aquatic life is due to excessive sedimentation or siltation.

ADEQ is developing an implementation guidance document that proposes to use bioassessment to determine whether aquatic life is impaired in a surface water. An ADEQ bioassessment would involve: 1) the collection of benthic macroinvertebrates from riffle habitats in wadeable, perennial streams, 2) the collection of relevant habitat and chemical water quality measurements, 3) taxonomic identification of specimens in the sample, and 4) comparison of the sample site species list with a composite reference species list using a multi-metric analysis tool to evaluate attainment of the aquatic and wildlife use. Because bioassessments are a direct measure of the condition of a biological community

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in a surface water, they are a better measure than surrogate chemical measurements for determining whether an impairment of aquatic life exists. ADEQ's bioassessment sampling protocols for use in wadeable, perennial streams in Arizona can be found in Meyerhoff and Spindler (1994).

Two multi-metric tools have been developed to assess biological integrity, one developed for support of the aquatic and wildlife (cold water) designated use and one for the aquatic and wildlife (warm water) designated use. These tools, called Indexes of Biological Integrity (IBI), consist of a combination of metrics or key attributes of the benthic macroinvertebrate community that best discern impairment from the reference condition. The cold water IBI consists of seven metrics selected for their ability to discriminate impairments in cold water streams located at more than 5000 feet of elevation. The seven metrics are: total taxa richness, Diptera taxa richness, intolerant taxa richness, Hilsenhoff Biotic Index (HBI), percent composition by Plecoptera (stoneflies), percent composition by scrapers, and scraper taxa richness. The warm water IBI consists of nine metrics that best discern impairment in warm water streams located at less than 5000 feet of elevation. The nine metrics are: total taxa richness, Ephemeroptera taxa richness (mayflies), Trichoptera taxa richness (caddisflies), Diptera taxa richness, percent Ephemeroptera abundance, percent composition by the dominant taxon, scraper taxa richness, percent composition by scrapers, and the Hilsenhoff Biotic Index. These metrics are easily calculated from a list of species and their abundances. A total IBI score is calculated as an average of the individual metric scores. The IBI score is then categorized as being exceptional, good, fair, or poor using a 25th percentile of reference value scoring system. Streams with an IBI score that is less than the 25th percentile of reference are not attaining the aquatic life designated use. The multi-metric tool measures structural, functional, tolerance, and richness characteristics of the benthic macroinvertebrate community and is empirically derived in Arizona. The two Indexes of Biological Integrity can be found in two documents, Gerritsen and Leppo (1998) and Gerritsen and Leppo (2000).

Once an impairment of aquatic life is found using a bioassessment and the applicable IBI, the next step is to collect and evaluate habitat data and chemical stream data to diagnose the probable cause of the impairment. ADEQ proposes to use qualitative habitat assessment observations and associated quantitative measurements related to bottom deposits to determine if an impairment of aquatic life in a surface water is caused by excessive sedimentation or siltation. ADEQ is developing a habitat assessment index consisting of four substrate parameters and one bank stability parameter adapted from USEPA's visual-based habitat assessment protocols described in the Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition (July 1999).

There are two habitat assessment indexes, one for use in cold water habitats in streams located at more than 5000 feet of elevation and one for use in warm water habitats located at less than 5000 feet in elevation. Each habitat assessment index involves visual-based field observations of in-stream and bank habitat parameters associated with bottom deposits on a ranking scale of one to four. The five habitat parameters are riffle substrate, pool substrate, embeddedness, sediment deposition, and bank stability. To ensure consistency in the habitat assessment procedure, written descriptions of each habitat parameter and the visual-based evaluation criteria for each category are included on a standardized assessment form. The habitat scores are summed for a total habitat score ranging from 5 - 20. The habitat score is then categorized as being good, fair, or poor using a 25th percentile of reference value scoring system. If the habitat index score is less than the 25th percentile of reference, then a biological impairment is determined to be associated with bottom deposits and an exceedance of the narrative bottom deposit standard results.

ADEQ is considering the use of the IBI scores accompanied by habitat assessment index scores to implement the narrative bottom deposits standard. ADEQ acknowledges that the use of the proposed implementation procedure has some limitations. ADEQ's current bioassessment protocols and indexes of biological integrity only apply to wadeable, perennial streams. They do not apply to lakes, reservoirs, large rivers (that is, non-wadeable), intermittent waters, ephemeral waters, or effluent-dependent waters. Because the implementation of the bottom deposits narrative standard depends upon the use of bioassessment and the use of an applicable index of biological integrity to establish aquatic life impairment, the narrative standard for bottom deposits cannot be implemented for other types of surface water until ADEQ develops appropriate bioassessment procedures and associated indexes of biological integrity for them (or alternative implementation procedures). Consequently, the narrative bottom deposits standard would apply initially only to wadeable, perennial streams.

The Arizona Legislature recently enacted a law relating to the adoption of implementation procedures for narrative water quality standards. A.R.S. § 49-232 (Added by Laws 2000, Ch. 162, § 1) addresses the list of impaired surface waters that ADEQ must prepare under § 303(d) of the Clean Water Act. The law prescribes substantive and procedural requirements for developing the list of impaired surface waters. The law requires that ADEQ adopt, by rule, the methodology that it will use to identify impaired surface waters. The listing methodology rules must specify criteria for listing surface waters on the § 303(d) list, including any implementation procedures that specifically identify the objective basis for determining that a violation of a narrative water quality standard exists [See A.R.S. § 49-232(C)(4)].

A.R.S. § 49-232(F) specifically addresses the listing of impaired waters on the ground that a narrative water quality standard has been violated. Before ADEQ can include a surface water on the § 303(d) list on the basis of a narrative water quality standard violation, ADEQ must, after providing an opportunity for public notice and comment, adopt implementation procedures that specifically identify the objective basis for determining that a violation of the narra-

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tive standard exists. A total maximum daily load (TMDL) analysis designed to achieve compliance with a narrative standard cannot be performed until implementation procedures for the narrative standard are adopted.

ADEQ has concluded that A.R.S. § 49-232 requires the adoption of narrative standard implementation procedures by rule before a violation of a narrative standard can be used as grounds for listing under § 303(d) or for TMDL purposes. ADEQ did not propose to adopt narrative standards implementation procedures by rule in this triennial review and cannot submit a final rule addressing this subject at this stage of this rulemaking. ADEQ will address narrative standard implementation procedures in a separate rulemaking to be initiated in 2002.

Narrative standard for suspended solids

ADEQ proposes to adopt a new narrative standard to address excessive concentrations of suspended solids in surface waters to prevent impairment of the domestic water source designated use. Excessively high suspended solids concentrations can negatively affect the use of a surface water as a raw water source for drinking water supply. Suspended solids and sediment can cause taste and odor problems in drinking water, block drinking water plant uptakes, foul drinking water treatment systems, and increase operation and maintenance costs at water treatment plants. Suspended solids also can shield pathogenic microorganisms from the action of disinfectants and reduce disinfection efficiency at a water treatment plant.

The ability of a drinking water treatment plant to remove suspended solids from a raw surface water source to achieve acceptable final turbidities required by Safe Drinking Water Act regulations is a function of the composition of the suspended material in a surface water source as well as its concentration. Very high suspended solids levels in a surface water may require that intakes for drinking water treatment plants be shut down until a surface water source clears or they may result in increased system maintenance (for example, more frequent back-flushing of filters). Because of the variability of water treatment plant removal efficiencies, it is not possible for ADEQ to prescribe a single numeric criterion for suspended solids to maintain and protect water quality for the domestic water source designated use. However, a narrative standard can be developed that prohibits suspended solids in amounts or concentrations that interfere with the ability of a water treatment plant to comply with Safe Drinking Water Act requirements. ADEQ added a new narrative standard to prohibit excessively high concentrations of suspended solids in a surface water that impair a domestic water source use in R18-11-108(C). ADEQ adopted the following narrative standard in the final rule:

- C. A discharge of suspended solids to a surface water shall not be in quantities or concentrations that either interfere with the treatment processes at the nearest downstream potable water treatment plant or substantially increase the cost of handling solids produced at the nearest downstream potable water treatment plant.

The intent of the proposed narrative standard is to maintain and protect water quality so surface waters can be used as raw drinking water sources. As with the other narrative water quality standards, ADEQ intends to develop specific implementation procedures in a separate rulemaking to be initiated in 2002.

Revision of the narrative standard prohibiting off-flavor in aquatic organisms or waterfowl

ADEQ amended R18-11-108(A)(4), which states that surface waters shall be free from pollutants that cause off-flavor in aquatic organisms *or waterfowl*. ADEQ repealed the reference to “or waterfowl” because it is inconsistent with EPA’s recommended national criteria for tainting substances and because ADEQ does not have practical implementation procedures to determine compliance with the “waterfowl” part of the current standard.

Implementation procedures exist for determining compliance with the part of the narrative standard that is intended to protect against undesirable organoleptic effects in edible portions of aquatic organisms. For example, EPA has published national criteria guidance on tainting substances in Quality Criteria for Water, 1986 (the “Gold Book”). EPA recommends the following narrative criterion for tainting substances:

Materials should not be present in concentrations that individually or in combination produce undesirable flavors *which are detectable by organoleptic tests performed on the edible portions of aquatic organisms* [Emphasis added].

The rationale in the EPA criteria document for tainting substances is clearly focused on preventing abnormal or undesirable flavors in fish or shellfish. Obviously, abnormal flavors in fish and shellfish negatively affect product quality, marketability, and consumer acceptance of fish and shellfish that are sold in foreign or interstate commerce. Recreational fishing also is adversely affected by tainting substances in surface water that result in off-flavored fish. For most sport fishermen, the consumption of their catch is an important part of their recreation. An off-flavored catch may result in the diversion of fishermen and recreational fishing activity to surface waters that are not impacted by tainting substances.

The EPA Gold Book contains a review of studies on tainting substances that impair the flavor of aquatic organisms. Earlier EPA criteria documents, such as Water Quality Criteria 1972 (the “Blue Book”), contain discussions on tainting substances and the use of field exposure and organoleptic tests to determine the existence or the magnitude of a tainting problem in a surface water. Field exposure tests involve holding test species of fish or other edible aquatic life in cages at selected locations in a surface water where a tainting problem is suspected and subsequently conducting flavor tests on the edible portions of the fish or aquatic organisms. Field exposure tests are time-consuming and organoleptic tests require experienced judges who are trained in conducting flavor evaluations. While it would be difficult for ADEQ to conduct field exposure tests or the organoleptic tests to determine compliance with the current

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narrative standard, at least implementation procedures exist that ADEQ could use to determine compliance on a case-by-case basis where a tainting problem in a surface water is suspected. However, there is nothing in the discussion of tainting substances in the EPA criteria guidance documents that relates to undesirable organoleptic effects in waterfowl. Moreover, because waterfowl are migratory, it would be impossible to establish a cause-and-effect relationship between tainted flesh in waterfowl and pollution of Arizona surface waters. For these reasons, ADEQ repealed the reference to “or waterfowl” in R18-11-108(A)(4). ADEQ revised the narrative standard as follows:

A. A surface water shall be free from pollutants in amounts or combinations that:

4. Cause off-flavor in aquatic organisms ~~or waterfowl~~.

ADEQ recommends determining compliance with the proposed narrative standard by using field exposure tests and organoleptic tests conducted on the edible portions of aquatic organisms (for example, fish) as described in the EPA criteria documents. ADEQ does not routinely monitor surface waters for the presence of pollutants that cause off-flavor in aquatic organisms. The field investigation of a surface water that is suspected of having a tainting problem may be initiated as part of a complaint investigation. Again, ADEQ intends to specifically address implementation procedures for this narrative standard in a future

rulemaking. ADEQ will not include any surface water on the § 303(d) list on the basis of a violation of this organoleptic standard until implementation procedures are adopted by rule.

Narrative color standard [R18-11-108(A)(8)]

R18-11-108(A)(8) states that a surface water shall be free from pollutants in amounts or combinations that “change the color of the surface water from natural background levels of color.” The intent of this narrative standard is to maintain and protect the aesthetic qualities of surface waters and to prohibit discharges of pollutants that cause unnatural and objectionable colors in a surface water.

Color in water results primarily from degradation processes in the natural environment. Although colloidal forms of iron and manganese occasionally are the cause of color in water, the most common causes of color change are complex organic compounds originating from the decomposition of naturally-occurring organic material. Sources of organic material include materials from soils such as tannins and humic acids, decaying plankton and other decaying aquatic plants; and wastewater discharges. Industrial discharges may contain color-changing organic compounds (for example, discharges from pulp and paper industrial facilities). Other industrial discharges may contain brightly colored substances such as those from certain processes in the textile and chemical industries (for example, dyes).

Surface waters also may appear colored because of the presence of suspended solids and turbidity. Color that is due to suspended matter and turbidity is commonly referred to as apparent color. Changes in the apparent color of a surface water due to turbidity and suspended solids are acceptable when the change is due to natural background. Turbidity and suspended solids that are present in a surface water because of naturally-occurring conditions and are not the result of a discharge or anthropogenic activity falls within the meaning of “natural background levels of color.” For example, a surface water that normally flows clear may appear brown in color during a flood event because of high concentrations of suspended solids and turbidity. In this example, the change in the color of the surface water during a flood event would be considered to be a part of the natural background. On the other hand, a surface water may change color because of the discharge of a highly colored industrial wastewater whose color is contributed principally by colloidal or suspended materials in the discharge. In the latter example, the change in the apparent color of the surface water would be a change from the natural background levels of color. Changes in the apparent color of a surface water from a highly colored point source discharge or other human activities are prohibited by the narrative color standard.

Apparent color is differentiated from true color. True color is the color of a surface water from which suspended matter and turbidity has been removed. ADEQ considers changes in the true color of a surface water that are caused by highly colored point source discharges or other human activities to violate the current narrative standard. However, changes in the true color of surface water due to naturally-occurring conditions (for example, the decay of aquatic plants or the presence of tannins in the water) would not be considered a violation of the narrative color standard.

In a preliminary draft set of revisions to the surface water quality standards rules, ADEQ suggested a revision of the current color narrative standard. ADEQ suggested amending the narrative standard to state that surface waters shall be free from pollutants in amounts or concentrations that “produce objectionable color.” ADEQ received public comments opposing the suggested revision on the ground that the word “objectionable” was a subjective term that would make consistent enforcement of the narrative standard more difficult. ADEQ agreed and did not propose the suggested revision in the final rule package. The comment was made that if any change to the narrative color standard was deemed necessary, then the standard should incorporate some definition of what “color” means. Citing Standard Methods for the Examination of Water and Wastewater, 20th Edition, one commenter suggested that the narrative standard should address only true color. The commenter suggested the following revision to the narrative standard: “A surface water shall be free from pollutants in amounts or combinations that.....produce a change in the true color of the navigable water from natural background levels of true color.” For reasons given above, ADEQ disagrees with limiting the narrative standard to true color only. The narrative standard should prohibit changes in true color or apparent color that are not due to naturally-occurring conditions. ADEQ decided that the language in the current narrative standard is preferable to ADEQ’s suggested revision in the preliminary draft rules and the alternative language suggested in comments on the preliminary draft rules. ADEQ retained the current narrative standard without change

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in this triennial review. As with the other narrative standards in R18-11-108, ADEQ acknowledges that it cannot use a violation of the color narrative standard for § 303(d) listing purposes before specific implementation procedures are adopted.

Numeric Water Quality Criteria [R18-11-109]

Revision of the Current Bacterial Water Quality Standards in R18-11-109(B) and (C)

a. *Purpose of bacterial water quality standards*

Water quality standards for bacteria are concentrations of indicator organisms that should not be exceeded in order to protect human health from waterborne pathogens. Pathogens are disease-causing organisms that include viruses, parasites, and bacteria. Many waterborne pathogens cannot be measured directly. Surface waters may contain different pathogens, making individual measurement and quantification impractical, even if analytical methods were available to detect all pathogens of concern. Consequently, indicator organisms are used to predict human health risks from pathogens that may be present in surface waters. EPA has conducted health effects studies that demonstrate that *Escherichia coli* (*E. coli*) and enterococci are best suited for predicting the presence of pathogens in freshwater that cause human gastrointestinal illness. EPA published these recommendations in Ambient Water Quality Criteria for Bacteria - 1986, U.S. Environmental Protection Agency, EPA-440 / 5-84-002.

EPA has strongly encouraged states to adopt its national criteria recommendations for *E.coli* or enterococci to replace surface water quality standards that are expressed as concentrations of total coliform or fecal coliform organisms. In recent EPA implementation guidance for the ambient water quality criteria for bacteria, EPA stated that the transition to *E. coli* and enterococci criteria is a high priority for EPA in its review of state-adopted water quality standards in triennial reviews occurring in 2000 - 2002. EPA has stated in its implementation guidance that if states fail to adopt bacteria standards that are consistent with its national criteria guidance, EPA intends to federally promulgate water quality standards to ensure that its national criteria guidance recommendations for bacteria apply in all states, territories, and authorized tribes by 2003. ADEQ adopted *E. coli* criteria for the state's full-body contact designated use in 1996. In this triennial review, ADEQ amended the current bacterial standards in R18-11-109(B) and (C) to be more consistent with EPA ambient water quality criteria for bacteria.

b. *History of current water quality standards for bacteria*

Environmental protection and public health officials have been concerned for many years about the development of appropriate standards for protecting the microbiological quality of surface waters that are used for bathing and swimming. Microbiological water quality standards for surface waters were first considered in 1924 by the American Public Health Association's Committee on Bathing Places ("the APHA Committee"). At first, the APHA Committee did not recommend microbiological water quality standards because of the lack of epidemiological data to support standards and because the APHA Committee was reluctant to alarm the public about the dangers of outdoor bathing places without good evidence. The APHA Committee maintained this position until 1936 when it recommended a water quality standard that said that water quality was unacceptable for bathing if total coliform bacteria densities in water were greater than 1,000 per 100 ml. The APHA Committee's decision to recommend a water quality standard expressed as a total coliform concentration was based on the belief that coliform organisms were associated with fecal material from the gut of warm-blooded animals and that the presence of coliform organisms in surface water was an indicator of the potential presence of enteric pathogens.

In the late 1940's and 1950's, the U.S. Public Health Service conducted a series of epidemiological studies at bathing places in Chicago, Kentucky, and Long Island, New York to determine the human health effects associated with swimming in surface waters. The studies showed that there was a detectable human health effect (diarrhea) when total coliform densities in water were approximately 2,000 per 100 ml and greater. Based on this finding and a second finding that the subset of fecal coliform organisms was a better indicator of microbiological water quality in recreational waters than total coliforms, the National Technical Advisory Committee of the Federal Water Pollution Control Association (NTAC) recommended water quality standards for bacteria in surface waters. The recommended standards were published in the 1968 Report to the Committee on Water Quality Criteria (the "Green Book"). The NTAC recommended that fecal coliforms be used as indicator organisms for evaluating the microbiological quality of surface waters used for recreation. The NTAC also recommended that fecal coliform densities in a surface water should not exceed a log mean of 200 per 100 ml based upon a minimum of 5 samples taken within a 30-day period. The NTAC also recommended that not more than 10% of the samples collected during a 30-day period should exceed 400 per 100 ml, as determined by either the multiple tube fermentation or the membrane filter procedure.

In 1972, EPA initiated a series of human health effects studies at marine and fresh water bathing beaches. These studies were designed to determine if swimming in sewage-contaminated water carried a health risk for bathers, and, if so, to what types of illnesses. EPA also wanted to determine which indicator organism was best correlated to swimming-associated health effects and if there was a strong enough relationship between any particular indicator and health effects to support the recommendation of a water quality criterion. EPA studied the differences in symptomatic illness between swimming and non-swimming beach goers at marine beaches between 1972-1978 and fresh water bathing beaches between 1978-1982. The health effects studies showed that: 1) swimmers who bathed in sewage-contaminated water were at greater risk of contracting gastroenteritis, and 2) as the microbiological quality of water degrades, the swimming-associated illness rate increases. From EPA's evaluation of the bacteriological data from the

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health effects studies, EPA estimated that there would be eight illnesses per 1,000 swimmers if persons swam in fresh water with a maximum geometric mean of 200 fecal coliforms per 100 ml.

In the 1976 water quality criteria document (the "Red Book"), EPA recommended the fecal coliform criteria that NTAC had previously recommended in the Green Book (that is, a five-sample mean of 200 fecal coliforms per 100 ml) as the microbiological water quality standard for surface waters that were used for recreation. Many states, including Arizona, appear to have adopted EPA's recommended fecal coliform criteria as surface water quality standards for primary contact recreation or the full-body contact recreation designated use.

In 1986, EPA recommended new criteria to maintain and protect microbiological water quality in surface waters that were used for recreation. EPA recommended that states adopt either enterococci or *E. coli* water quality criteria for fresh water used for recreation. EPA's fresh water health effects studies conducted between 1972-1982 confirmed that there was a strong correlation between *E. coli* densities and swimming-related gastrointestinal illness and that *E. coli* was a better indicator of swimming-associated gastrointestinal illness than fecal coliform [See Dufour, Alfred, Health Effects Criteria for Fresh Recreational Waters, EPA 600 / 1-84-004, Health Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (August, 1984)]. EPA recommended that the 30-day geometric mean concentration (5-sample minimum) of *E. coli* in fresh water should not exceed 126 cfu / 100 ml. This value was based on the same risk level of contracting gastrointestinal illness (no more than 8 illnesses per 1,000 swimmers) that previously was used for the recommended fecal coliform criteria. EPA also recommended single sample maximum concentrations of *E. coli* based upon anticipated levels of bathing use. The recommended single sample maximum concentrations were:

- Designated bathing beach: 235 cfu / 100 ml.
- Moderate use for bathing: 276 cfu / 100 ml.
- Light use for bathing: 298 cfu / 100 ml.
- Infrequent use for bathing: 576 cfu / 100 ml.

In 1996, ADEQ adopted *E. coli* criteria to maintain and protect surface water quality for the full-body contact recreation designated use. The *E. coli* criteria were based upon EPA's national criteria guidance for bacteria. ADEQ adopted a 30-day geometric mean criterion (5-sample minimum) of 130 cfu / 100 ml. This criterion was based on EPA's recommended *E. coli* criterion of 126 cfu / 100 ml rounded to the nearest ten. ADEQ adopted a single sample maximum concentration of 580 cfu / 100 ml. The single sample maximum concentration was based upon EPA's least stringent single sample maximum concentration for fresh waters that are infrequently used for bathing (that is, 576 cfu / 100 ml rounded to the nearest ten).

EPA recently reaffirmed its recommended water quality for bacteria in a document called Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria -- 1986, U.S. Environmental Protection Agency, Office of Water, EPA-823-D-00-001 (January, 2000), § 2.0. EPA reviewed the original health effects studies supporting its recommended 1986 water quality criteria for bacteria and the literature on epidemiological studies conducted after EPA performed its initial marine and freshwater studies of swimming-associated health effects. As a result of these reviews, EPA concluded that when applied and implemented conservatively, EPA's recommended criteria for *E. coli* are more protective of human health for gastrointestinal illness than fecal coliform criteria. EPA concluded:

The epidemiological studies conducted since 1984, which examined the relationships between water quality and swimming-associated health effects, have not established any new or unique principles that might significantly affect the current guidance EPA recommends for maintaining the microbiological safety of marine and freshwater bathing beaches. Many of the studies have, in fact, confirmed and validated the findings of the U.S. EPA studies. There would appear to be no good reason for modifying the Agency's current guidance for recreational waters at this time.

As a result of its review, EPA reaffirmed its 1986 water quality criteria for *E. coli* as representing the best available science and serving as a defensible foundation for protecting public health in surface waters that are used for recreation. ADEQ adopted these *E. coli* criteria to protect recreational uses of surface waters in Arizona.

a. More stringent E. coli criteria for the full-body contact designated use

ADEQ revised the current *E. coli* criteria for the full-body contact recreation designated use in this triennial review. ADEQ adopted a slightly more stringent geometric mean concentration of 126 cfu / 100 ml for the FBC designated use (the current geometric mean standard is 130 cfu / 100 ml). The *E. coli* criterion of 126 cfu / 100 ml is the same as EPA's national criteria guidance recommendation for *E. coli*. ADEQ also adopted a more stringent single sample maximum criterion for the FBC designated use. The current single sample maximum for FBC (580 cfu / 100 ml) is based on the least stringent microbiological quality criterion that EPA recommends for surface waters that are infrequently used for full-body contact recreation. ADEQ's adoption of the least stringent criterion as a statewide standard in the last triennial review results in its application to all surface waters in the state with the FBC designated use, regardless of the level of expected recreational use. Consequently, the least stringent single sample maximum criterion applies equally to surface waters with designated bathing beaches that are heavily used for recreation and surface waters that are infrequently used for recreation. While the least stringent *E. coli* criterion recommended by EPA may be appropriate for surface waters in Arizona that are infrequently used for swimming or bathing, it may not provide

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an adequate level of human health protection in surface waters that receive heavy recreational use [for example, Slide Rock at Oak Creek, the area of the Lower Salt River used for tubing, designated bathing beaches along the Colorado River and at Saguaro and Canyon Lakes]. For this reason, ADEQ adopted the EPA-recommended single sample maximum criterion of 235 cfu / 100 ml for designated bathing beaches as the statewide criterion for the FBC designated use. The adoption of a more stringent single sample maximum criterion ensures that heavily-used recreational waters in the state are protected by adequate microbiological water quality standards.

b. Adoption of E. coli criteria for the partial-body contact recreation designated use

ADEQ also adopted EPA's recommended *E. coli* criteria for the partial-body contact (PBC) designated use. The current water quality criteria for the PBC designated use are expressed as fecal coliform concentrations. ADEQ adopted *E. coli* criteria for the PBC designated use for two reasons. First, *E. coli* criteria are more scientifically defensible. The *E. coli* criteria are supported by the health effects studies that have been conducted to support EPA's national criteria guidance recommendations for bacteria. EPA recommends the use of *E. coli* as an indicator organism instead of fecal coliforms. Second, ADEQ questions the scientific defensibility of the current fecal coliform criteria for the PBC designated use. The current fecal coliform criteria for the PBC designated use are as follows:

30-day geometric mean (5-sample minimum): 1000 cfu / 100 ml
10% of all samples for a 30-day period: 2000 cfu / 100 ml
Single sample maximum: 4000 cfu / 100 ml

ADEQ has been unable to find anything in the national criteria documents or health effects literature that supports the current fecal coliform densities for the PBC designated use. ADEQ has been unable to find anything in the literature that supports a quantifiable relationship between the fecal coliform densities prescribed in the current rule and human health risks associated with exposure to surface waters through partial-body contact recreational activities.

EPA does not recommend water quality criteria for secondary or partial-body contact recreation to protect human health. Water quality criteria for the PBC designated use might conceivably be based on human health effects of dermal contact, inhalation, or incidental ingestion of surface water. However, there is very little human health effects data for such exposures. EPA acknowledges that there is significant uncertainty in recreational water risk assessments regarding the actual exposure levels associated with ingestion, inhalation, and dermal contact with contaminated water and corresponding levels of illness [See "Action Plan for Beaches and Recreational Waters," U.S. Environmental Protection Agency, Office of Research and Development, Office of Water, EPA / 600 / R-98 / 079, March, 1999, p. 8]. In light of this uncertainty, ADEQ adopted the same geometric mean criterion for *E. coli* that EPA recommends for full-body contact recreation as the water quality criterion for the PBC designated use [that is, 126 cfu / 100 ml]. ADEQ adopted the same *E. coli* criteria to maintain and protect water quality for FBC and PBC. EPA has stated that it considers this approach to be consistent with § 101 of the Clean Water Act. ADEQ believes that a conservative approach to public health protection is justified in the absence of definitive risk assessments or scientifically defensible *E. coli* criteria for the PBC designated use. In effect, ADEQ adopted microbiological water quality criteria for PBC that err on the side of protecting human health. Surface water quality that is acceptable for swimming should also be acceptable for recreational activities that do not involve swimming or full-body contact recreation. ADEQ adopted the least stringent *E. coli* single sample maximum criterion of 576 cfu / 100 ml that applies to surface waters that are infrequently used for bathing as the most appropriate single sample maximum criterion for the PBC designated use. The final rule states:

~~E. A.~~ The following water quality standards for *Escherichia coli* (*E. coli*), expressed in colony forming units per 100 milliliters of water (cfu / 100 ml), shall not be exceeded:

E. coli	FBC	PBC
30-day geometric mean (5-sample minimum) 130		
Geometric mean (Four-sample minimum)	126	126
Single sample maximum	580 235	576

c. Repeal of fecal coliform criteria for effluent-dependent waters

ADEQ repealed the current fecal coliform criteria that have been established for effluent-dependent waters (EDWs) prescribed in R18-11-109(B)(2). The current microbiological water quality standards for EDWs are the same fecal coliform criteria that previously applied to the FBC designated use prior to the adoption of *E. coli* criteria for FBC in 1996. The current fecal coliform criteria for EDWs appear to be based on the NTAC recommendations for microbiological water quality standards to protect recreational surface waters that date back to 1968. When ADEQ updated the criteria that applied to the FBC designated use and changed the microbiological indicator from fecal coliform to *E. coli* in the last triennial review, ADEQ did not revise the microbiological water quality criteria that applied to EDWs. ADEQ did not adopt *E. coli* criteria for EDWs at that time because ADEQ did not want to suggest that water quality in EDWs was acceptable for the full-body contact recreation use. However, the same rationale that supports revision of the FBC standards to *E. coli* applies equally to the revision of the current water quality standards for EDWs. The microbiological water quality criteria for EDWs should be expressed as *E. coli* concentrations because *E. coli* is a better indicator of microbiological water quality and there is a stronger correlation between *E. coli* concentrations and swimming-related illness than with fecal coliform.

ADEQ made a policy decision prior to the last triennial review to maintain and protect microbiological water quality in EDWs at the same level as surface waters that are protected for full-body contact recreation to protect human

health and to provide a margin of safety. However, the state did not want to establish FBC as a designated use for EDWs because it did not want to suggest that EDWs were suitable for swimming and other full-body contact recreation activities. The new *E. coli* criteria to protect the FBC and PBC designated uses are the same in one important respect; they both have the same four-sample geometric mean of 126 cfu / 100 ml. With the adoption of the revised *E. coli* criteria, ADEQ can retain the PBC designated use for EDWs and also retain a high level of microbiological water quality in EDWs that is equivalent to FBC protection for surface waters that are infrequently used for full-body contact recreation.

All EDWs that are listed in the surface water quality standards rules are protected by the PBC designated use. If ADEQ adopts *E. coli* criteria for the PBC designated use in this triennial review and does not repeal the current fecal coliform criteria that apply to EDWs, then EDWs will have microbiological water quality standards that are expressed as fecal coliforms and *E. coli*. Wastewater treatment plants that discharge to EDWs will be required to conduct discharge monitoring for fecal coliform and *E. coli*. Two different microbiological water quality standards to protect human health in EDWs are unnecessary. The current fecal coliform criteria for EDWs can and should be repealed to eliminate redundant monitoring requirements.

d. Repeal of fecal coliform for the domestic water source, aquatic and wildlife, agricultural irrigation, and agricultural livestock watering designated uses

ADEQ repealed the fecal coliform criteria that have been established to protect the domestic water source (DWS), aquatic and wildlife designated uses (A&W), agricultural irrigation (AgI), and agricultural livestock watering (AgL) designated uses. ADEQ repealed these criteria for several reasons.

First, the fecal coliform criteria for the DWS, A&W, AgI, and AgL designated uses are superseded by more stringent *E. coli* criteria for the FBC and PBC designated uses. All surface waters in Arizona, with the exception of certain canals, have either a FBC or PBC designated use. Consequently, almost every surface water in the state is protected by *E. coli* criteria. Less stringent bacterial water quality standards for the DWS, A&W, AgI, and AgL designated uses are no longer necessary.

Second, the scientific defensibility of the current fecal coliform criteria for the DWS, A&W, AgI, and AgL designated uses is questionable. There are no national criteria guidance recommendations for bacteria for the DWS, A&W, AgI, or AgL designated uses in the Gold Book. EPA only makes criteria recommendations for bacteria for freshwater bathing, marine bathing, and shellfish harvesting.

Third, older EPA recommendations for water quality criteria for bacteria in previous criteria documents are inconsistent with the state's current fecal coliform criteria prescribed in the surface water quality standards rules. For example, in Water Quality Criteria, 1972, EPA recommended that the geometric means of fecal coliform and total coliform densities not exceed 2000 / 100 ml and 20,000 / 100 ml respectively for surface waters that were used as public water supplies (that is, for the DWS designated use) after taking into consideration the treatment capabilities of water treatment plants. To ADEQ's knowledge, EPA has never recommended water quality criteria for bacteria for livestock watering or to maintain and protect water quality for aquatic life. The only rationale that ADEQ has found in previous EPA criteria documents that supports the current bacteria criteria is for agricultural irrigation. In 1972, EPA stated in the Blue Book that irrigation waters with a fecal coliform density of 1,000 fecal coliform organisms / 100 ml should contain sufficiently low concentrations of pathogenic microorganisms that no hazards to animals or man should result from the use or from consumption of raw crops irrigated with such water [See Water Quality Criteria, 1972, p. 351]. EPA's recommended Blue Book criterion is consistent with the current fecal coliform criterion for agricultural irrigation. However, ADEQ is repealing this criterion because ADEQ thinks it is no longer necessary because virtually all surface waters in Arizona are protected by *E. coli* criteria for the FBC and PBC designated uses.

Expression of the E. coli criteria as geometric means and as single sample maximum concentrations

The *E. coli* water quality standards are expressed as single sample maximum concentrations and geometric mean values. Both criteria must be met to support the FBC and PBC designated uses. The use of a geometric mean value in the standards may cause some confusion regarding how compliance with the standards is determined. Confusion may arise because the final *E. coli* standard is expressed as a geometric mean (four -sample minimum) and the current water quality standards for fecal coliform and *E. coli* bacteria are expressed as 30-day geometric means (five-sample minimum). That is, compliance with the current standard is based on a geometric mean of the sample results from a minimum of five samples taken within a 30-day period. Compliance with the bacteria standard in the final rule is determined by calculating the geometric mean from the results of the last four samples collected.

ADEQ did not include a 30-day averaging period in the final rule. EPA explains in its Draft Implementation Guidance for the Ambient Water Quality Criteria for Bacteria-1986 that the reference to a minimum of five samples in a 30-day period in EPA's 1986 criteria recommendations for bacteria "is for accuracy purposes only" [See p. 21 of the Draft Implementation Guidance]. EPA and ADEQ agree that more frequent sampling for bacteria yields more accurate results when determining a geometric mean. However, EPA has clarified in its implementation guidance that it is the geometric mean *of the samples collected* in conjunction with the single sample maximum standard that determines attainment of the recommended *E. coli* criteria. In other words, the 30-day averaging period is not a critical or required element of EPA's recommended criteria. For this reason, ADEQ amended the bacteria standards and removed the reference to a 30-day geometric mean. The adopted standard is simply expressed as a geometric mean (four -sample minimum).

ADEQ and EPA both recommend that full-body contact recreational areas be frequently monitored throughout the swimming season, particularly surface waters that are designated bathing areas, to ensure that human health is adequately protected. For example, there are some heavily used designated swimming areas in Arizona (such as Slide Rock State Park on Oak Creek) where frequent water quality monitoring for bacteria is recommended in the summer. Where frequent monitoring for bacteria occurs (for example, daily monitoring), a geometric mean of the samples that are collected within a 30-day averaging period is appropriate. However, in surface waters that are infrequently used for full-body contact recreation, less frequent water quality monitoring takes place and the use of a 30-day averaging period is impractical. For example, ADEQ conducts routine monitoring of surface waters for bacteria as part of its ambient surface water quality monitoring program. ADEQ typically monitors quarterly for bacteria at sampling sites. Under the current standards, ADEQ cannot determine compliance with a 30-day geometric mean (five-sample minimum) bacterial water quality standard. ADEQ does not take five samples within 30 days at any sampling site as part of its ambient surface water quality monitoring program.

Under the final rule, compliance with the *E. coli* standard is based on a four-sample minimum geometric mean. The bacterial water quality standard is expressed as a geometric mean concentration calculated from a minimum of four samples to provide regulatory flexibility. ADEQ can determine compliance with the standard based on four quarterly samples that are taken over the course of the water year as part of its routine surface water quality monitoring program. However, the expression of the *E. coli* standard in this way does not preclude more frequent water quality monitoring at popular bathing areas like Slide Rock State Park or the use of 30-day averaging periods in NPDES permits. The expression of the standard as a four-sample geometric mean permits compliance determinations with bacterial water quality standards in the vast majority of surface waters that are infrequently used for full-body recreation and infrequently monitored. ADEQ will be able to determine compliance from quarterly samples that are collected as part of the ambient surface water quality monitoring program.

It should be noted that compliance with the single sample maximum criteria for *E. coli* is determined from the analytical results of a single grab sample.

Temperature [R18-11-109(E)]

R18-11-109(E) prescribes limits on the maximum allowable increase in the temperature of a receiving surface water due to a discharge. The current water quality standard states that a maximum increase of 3.0° C from a discharge is allowed in a receiving water with the A&Ww and A&Wedw designated uses.

A maximum increase of 1.0° C due to discharge is allowed to a receiving surface water with the A&Wc designated use.

The water quality standards for temperature are intended to apply to point source discharges to surface waters where the thermal component of the discharge is controllable. The temperature criteria are not intended to apply to discharges to ephemeral waters because the flow in an ephemeral water consists entirely of point and nonpoint source discharges of storm water runoff. The temperature of a storm water discharge is highly variable and uncontrollable. ADEQ revised footnote 4 to clarify that the “maximum increase in temperature” standard does not apply to storm water discharges.

Repeal of the Current Numeric Turbidity Criteria [R18-11-109(F)]

ADEQ repealed the current turbidity criteria at R18-11-109(F). The current turbidity criteria are established to maintain and protect water quality for aquatic life designated uses (A&Wc, A&Ww, and A&Wedw). The current turbidity standards are as follows:

- F. The following water quality standards for turbidity, expressed as a maximum concentration in nephelometric turbidity units (NTU) shall not be exceeded:

	A&Ww, A&Wedw	A&Wc
Rivers, streams, and other flowing waters	50	10
Lakes, reservoirs, tanks, and ponds	25	10

Turbidity is a qualitative measure of water clarity or opacity. Turbidity in water is caused by fine suspended particles such as clay, silt, organic and inorganic matter, plankton, and other microscopic organisms. Turbidity is an expression of the optical property that causes light to be scattered and adsorbed rather than transmitted in straight lines through a water sample. The measurement of turbidity, read in nephelometric turbidity units (NTUs), is an index of light refraction when light strikes suspended particles in the water. As a qualitative measurement, turbidity gives only a relative assessment of particulate loading in a surface water. Turbidity is a surrogate measurement for *estimating* the amount of suspended solids that are in a surface water.

The source of the current turbidity criteria can be traced back to the first water quality standards adopted for surface waters in Arizona [See “Water Quality Standards for Surface Waters in Arizona,” State Department of Health, Water Quality Control Council (July 18, 1968)]. On July 18, 1968, the Water Quality Control Council (WQCC) adopted the following turbidity criteria to protect surface water quality for domestic and industrial water supply, recreation, and the protection of fish and wildlife:

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Turbidity of the water will be maintained at the lowest practicable values possible, but in no case shall:

- a. Turbidity in the receiving waters due to the discharge of wastes exceed 50 Jackson units in warm water streams or 10 Jackson units in cold water streams.
- b. Discharge to warm water lakes cause turbidities to exceed 25 Jackson units, and discharge to cold water or oligotrophic lakes cause turbidities to exceed 10 Jackson units.

The original water quality standards for turbidity cited appear to be based on recommendations made in Water Quality Criteria, Report of the National Technical Advisory Committee to the Secretary of the Interior (April 1, 1968) (the "Green Book"). The Green Book recommendation states:

Turbidity in the receiving water due to a discharge should not exceed 50 JTU in warm water streams or 10 JTU in cold-water streams. There should be no discharge to warm-water lakes which will cause turbidities exceeding 25 Jackson Units. The turbidity of cold-water or oligotrophic lakes should not exceed 10 units.

The Green Book recommendations for turbidity were based on research studies dating back to the 1930's. (Ellis, 1937; Smith, 1940; Wallen, 1951; Buck, 1956; Tarzwell, 1957; Wagner 1959; Ziebell, 1960; Herbert and Merckens, 1961). One of the studies cited in the Green Book discussion of turbidity [Buck (1956)] directly supports numeric criteria recommended by the National Technical Advisory Committee. Buck investigated several farm ponds, hatchery ponds, and reservoirs over a 2-year period and observed that the maximum fish yield occurred in farm ponds where the average turbidity of the water was less than 25 Jackson units. Buck observed that fish yields decreased in farm ponds as turbidities increased to between 25 and 100 Jackson units and decreased again when turbidities exceeded 100 Jackson units.

Another possible source for the recommended 25 JTU turbidity criterion for warm water lakes may have been the precision of the method used for measuring turbidity at the time the Green Book recommendations were made. The instrument originally designed for the measurement of turbidity and in use in 1968 when the Green Book turbidity recommendations were made was the Jackson candle turbidimeter. The Jackson candle turbidimeter was a laboratory device that measured a combination of optical parameters such as light scatter, adsorption, and reflectance using the human eye as the detector. The unit of measurement was called a Jackson candle unit, Jackson candle turbidity number, or Jackson turbidity unit (JTU). According to Standard Methods for the Examination of Water and Wastewater, the lowest turbidity value that could be measured by the Jackson candle turbidimeter was 25 JTUs. More precise instruments for measuring turbidity have since been developed. The newer instruments for measuring turbidity use incandescent light sources instead of a candle and they use automated photocell detectors instead of the human eye. Formazin suspensions were later accepted as the standard for calibration of turbidimeters and the unit of measurement became the formazin turbidity unit, or FTU, which subsequently evolved into the nephelometric turbidity unit (NTU). NTUs are currently used as the unit of measurement for turbidity. A NTU refers to the amount of light that is scattered at 90° when a turbidimeter is calibrated with formazin.

A comparison of the current turbidity criteria and the 1968 criteria shows that the numeric criteria have changed very little in over 30 years. Both sets of turbidity standards distinguish between streams and lakes and cold and warm surface waters. The only substantive change to the turbidity criteria in the last 30 years appears to be to the way that turbidity is measured. The units of measurement changed from Jackson turbidity units (JTUs) to nephelometric turbidity units (NTUs). However, the current numeric criteria for warm and cold water streams and lakes are the same as they were in 1968:

Comparison of 1968 and 1996 Turbidity Criteria

Type of surface water	1968	1996
Warm water streams	50 Jackson units	50 NTUs
Cold water streams	10 Jackson units	10 NTUs
Warm water lakes	25 Jackson units	25 NTUs
Cold water lakes	10 Jackson units	10 NTUs

ADEQ proposes to repeal the current numeric water quality criteria for turbidity for several reasons:

1. The current numeric turbidity standards appear to be based upon Green Book criteria recommendations that were made in 1968. The scientific defensibility of the current turbidity criteria is questionable. Current EPA criteria guidance for turbidity no longer includes the Green Book recommendations.
2. The current turbidity criteria are expressed as single sample maximum concentrations. In Arizona, with its variable climate and hydrology, a single sample maximum measurement of turbidity is scientifically indefensible. A single sample maximum does not account for the spatial and temporal variability in Arizona surface waters. Many variables can affect the suspended and settleable solids concentrations in a surface water. These variables include watershed size, land uses, slopes, precipitation intensity and duration, soil types, channel morphology, stream stability, and vegetative cover (to name just a few).
3. A single sample exceedance of the current turbidity standards is not correlated to impairment of aquatic life. There is no evidence that a one-time exceedance of the current turbidity criteria results in impairment of aquatic life designated uses.

4. Turbidity measurements are qualitative and they do not directly relate to the concentration of suspended solids in surface waters.

5. Turbidity data can be unreliable because of quality assurance and quality control problems associated with both field and laboratory measurements of turbidity. The laboratory measurement of turbidity in surface water may be unreliable because of exceedances of recommended sample holding times for turbidity analysis. Standard Methods recommends that water samples be analyzed in the laboratory on the same day that the sample is collected. Field measurements of turbidity are considered to be more reliable, but they may be affected by many variables including air bubbles; the sizes, shapes, and refractive characteristics of the particles that are suspended in the water; and differences in instrumentation. Standard Methods notes that variations of up to five times can result if different turbidimeters, all calibrated against the same standard, are used to measure the turbidity of a surface water.

6. According to Standard Methods, there is no direct relationship between the intensity of light scattered at a 90° angle (as measured in NTUs) and Jackson candle turbidity (JTUs). The absence of a direct relationship calls the current turbidity criteria into question because it appears that the units of measurement changed from JTUs to NTUs while the same numeric criteria that were adopted in 1968 have been maintained. In other words, because of fundamental differences between modern turbidimeters and the Jackson candle turbidimeter, results that are expressed in JTUs may not be equivalent to results expressed in NTUs (that is, 50 NTUs $\frac{1}{4}$ 50 JTUs).

For all of these reasons, ADEQ repealed the current numeric turbidity criteria. Instead, ADEQ will rely on 1) a numeric criterion for suspended sediment concentration to protect fish, and 2) a narrative standard for bottom deposits to maintain and protect water quality for aquatic life.

Numeric suspended sediment concentration criteria to protect aquatic life

While ADEQ no longer supports the current turbidity criteria to protect aquatic life, ADEQ recognizes that the concentration of suspended solids in a surface water is an important water quality parameter because of the effect of suspended solids on light penetration, temperature, and on aquatic life. The importance of fluvial sediment to the quality of aquatic and riparian systems is well established. The U.S. Environmental Protection Agency identifies sediment as the single most widespread cause of impairment of the nation's rivers and streams, lakes, reservoirs, ponds, and estuaries.

Suspended solids can affect several trophic levels and components of an aquatic ecosystem. For example, the EPA Water Quality Criteria 1986 document cites a report by the European Inland Fisheries Advisory Commission (EIFAC) that identifies four adverse effects of excessively high concentrations of suspended solids on fish. Excessively high concentrations of suspended solids:

- Act directly on fish swimming in the water in which solids are suspended, either by killing them or reducing their growth rate and resistance to disease;
- Prevent the successful development of fish eggs and larvae;
- Modify the natural movements and migrations of fish; and
- Reduce the abundance of food available to fish.

With regard to the effects of suspended solids on fisheries, EIFAC goes on to report that:

- There is no evidence that concentrations of suspended solids less than 25 mg / L have any harmful effects on fisheries;
- It should be possible to maintain good or moderate fisheries in surface waters that normally contain 25 to 80 mg / L suspended solids, however, the yield of fish from such waters may be lower than from those surface waters that have suspended solids less than 25 mg / L;
- Waters normally containing from 80 to 400 mg / L suspended solids are unlikely to support good fresh water fisheries, although fisheries may be found at the lower concentrations within this range; and
- Only poor fisheries are likely to be found in waters that normally contain more than 400 mg / L suspended solids.

[See Water Quality Criteria 1972, A Report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences and National Academy of Engineering, Washington, D.C., 1972].

Increases in suspended solids concentrations in a surface water may negatively affect fish populations in other ways. As noted above, high concentrations of suspended solids act directly on fish and cause stress reactions, behavioral modifications, reduce resistance to disease, and clog and abrade gill membranes. High concentrations of suspended solids reduce light penetration in a surface water and this can adversely affect fish reproductive processes. Some fish species have strong visual components to their reproductive behavior. For example, researchers have found that largemouth bass spawning was delayed by as much as 30 days in turbid surface waters as compared to clear surface waters. Studies have shown that smallmouth bass populations shun potential spawning areas that are highly turbid. Reproductive failure among many fish species can be attributed to the direct loss of spawning habitat due to siltation of formerly clean substrates and the loss of vegetation due to reductions in the size of the photic zone. Suspended solids also can impair the ability of sight feeding fish to locate their prey. It also can cause modifications in the natural movements and migrations of fish.

Suspended solids can reduce the size of the photic zone in a surface water and the amount of light available to aquatic plants. A decrease in light penetration reduces photosynthetic activity and can result in a reduction of primary production in a surface water. A decrease in light penetration may affect the depth distribution of vascular plants and algae. Greatly reduced light penetration may shift the algal composition of a surface water from green algae to blue-green algae because the latter are more tolerant of higher levels of ultraviolet light. Zooplankton populations also may be reduced because of decreases in primary productivity. Zooplankton are a major source of food for fish and a reduction in their population can have an adverse effect on fish populations. In 1974, a National Academy of Sciences (NAS) committee recommended that the depth of light penetration in a surface water not be reduced by more than 10 percent and EPA's current recommended criterion for suspended solids appears to be based on this NAS recommendation. EPA's recommended criterion in the Water Quality Criteria 1986 document states:

Suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life.

ADEQ decided not to propose this recommended criterion as a surface water quality standard because ADEQ does not have reliable data on what the seasonal norms are for the depth of the compensation point for photosynthetic activity in Arizona surface waters. EPA's recommended criterion cannot be implemented without this baseline data. Instead, ADEQ adopted a numeric suspended sediment concentration criterion that is intended to protect fish in surface waters. The proposed standard is based upon earlier EPA criteria guidance for suspended solids recommended in the Water Quality Criteria, 1972 document and U.S. Geological Survey research recommending the use of analytical methods that measure the sedimented sediment concentration. In the 1972 criteria document, EPA states that aquatic communities should be protected if the following maximum concentrations of suspended solids exist:

High level of protection	25 mg / L
Moderate level of protection	80 mg / L
Low level of protection	400 mg / L
Very low level of protection	Greater than 400 mg / L

The recommended maximum concentrations of suspended solids cited above apply to surface waters that *normally* contain those levels of suspended solids. The EPA guidance document states there is no evidence of harmful effects on fisheries if the concentration of suspended solids in a surface water is usually below 25 mg / L. If the concentration of suspended solids is usually below 80 mg/L, it is possible to maintain good or moderate fisheries. EPA's recommended criteria are intended to apply to rivers and streams at or near base flow (that is, a stream's "normal" flow regime). The EPA criteria document also notes that temporary high concentrations of suspended solids should be prevented in streams where good fisheries are to be maintained but that fish can tolerate high concentrations of suspended solids for short periods of time. Citing a study by Wallen (1951), the criteria document states that short-term behavioral reactions in fish were not observed until concentrations of suspended solids neared 20,000 mg / L and in one species reactions did not occur until suspended solids concentrations reached 100,000 mg / L. Most fish species that were tested endured exposures of more than 100,000 mg / L for a week or longer, but these same fishes finally died at suspended solids concentrations of 175,000 to 200,000 mg / L. Lethal concentrations caused the death of fishes within 15 minutes to two hours. This research suggests an approach to expressing numeric criteria for suspended sediment in Arizona surface waters.

The numeric standard for suspended sediment concentration (SSC) is intended to protect fish populations. Thus, the SSC criteria are derived for the protection of aquatic and wildlife designated uses only. Arizona has four subcategories of aquatic life designated uses: A&Wc, A&Ww, A&Wedw, and A&We. However, ADEQ proposes that the new suspended sediment concentration criteria apply only to the A&Wc and A&Ww designated uses.

The suspended sediment criteria should not apply to ephemeral waters (A&We) for two reasons. First, the proposed criteria are intended to protect fish and ephemeral waters do not support fish populations. Second, the proposed criteria are intended to apply at or near base flow conditions. Ephemeral waters are defined as surface waters that flow only in direct response to precipitation. There is no base flow in an ephemeral water. The "normal" flow regime of an ephemeral water is either no flow or high intensity, short-term flows associated with direct runoff from a precipitation event. An ephemeral water is normally a dry watercourse. Because the proposed criteria are intended to apply during a stream's "normal" flow regime, they do not apply to ephemeral waters that have no flow except in direct response to a precipitation event.

The suspended sediment criteria also should not apply to effluent-dependent waters (EDWs) for two reasons. First, the primary purpose of the proposed suspended sediment criteria is to protect fish populations. In most cases, EDWs either do not have fish populations or they have limited fish populations. Second, and more importantly, EDWs are created by the discharge of treated wastewater from a wastewater treatment plant to an ephemeral water. Point source discharges of treated wastewater from a wastewater treatment plant to an EDW are regulated under the federal secondary treatment regulation [See 40 CFR, Part 133]. The federal secondary treatment regulations establish technology-based effluent limits on the discharge of suspended solids from a wastewater treatment plant. Under 40 CFR § 133.102, the 30-day average of suspended solids cannot exceed 30 mg / L and the seven-day average cannot exceed 45 mg / L. In addition, federal secondary treatment regulations require a wastewater treatment plant to achieve a 30-day average percent removal of suspended solids of 85%. These technology-based requirements are more stringent than the proposed water quality criteria for suspended sediment concentration. ADEQ will rely on the secondary treatment regulations to provide effective control over the discharge of suspended solids to EDWs.

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It is clear from EPA's criteria recommendations for suspended solids in the Blue Book that the criteria recommendations are intended to be chronic criteria. The recommended criteria are intended to protect fish from long-term exposures to suspended solids in surface waters. The rationale in the Blue Book supporting EPA's recommended criteria states that fish can withstand much higher acute or short-term exposures to suspended solids. For this reason, ADEQ proposes to express the suspended sediment criteria as an average value (four -sample minimum) that must be achieved in a stream at or near base flow conditions. Water that flows in a surface water consists of a base flow fraction made up of ground water that infiltrates into a stream channel and a direct runoff fraction that enters the drainage system during and soon after a precipitation event. The SSC criterion is intended to apply only at or near base flow in a stream and not during storm events. Sample results that are taken in a stream during or soon after a precipitation event should not be used to determine compliance with the suspended sediment criterion.

Finally, the standard in the final rule is expressed as a suspended sediment concentration (SSC). The SSC analytical method, ASTM D 3977-97, Standard Test Method for Determining Sediment Concentration in Water Samples, is the U. S. Geological Survey (USGS) standard method for determining concentrations of suspended material in surface water samples. This method is used by all USGS sediment laboratories and by cooperating laboratories certified to provide suspended sediment data to USGS. The SSC method is described as the most accurate way to measure the total amount of suspended material in a water sample collected from a surface water. Recent studies on the accuracy of the SSC analytical method by ASTM and the U.S. Geological Survey Branch of Quality Systems (Gordon and others, 2000) have shown that SSC analysis represents a more accurate and reliable measure of the concentration of suspended sediment in a surface water sample. Other measurements, such as total suspended solids and turbidity, may be less expensive to collect or analyze but they result in unacceptably large errors and are fundamentally unreliable.

Differences between total suspended solids (TSS) and suspended sediment concentration analyses were investigated recently by the U.S. Geological Survey [See Gray, John R. et. al, Comparability of Suspended Sediment Concentration and Total Suspended Solids Data, Water Resources Investigation Report 00-4191, U. S. Department of the Interior, U.S. Geological Survey, August, 2000]. The USGS investigated differences in the data produced by TSS and SSC analyses by studying 3,235 paired TSS and SSC samples and 14,466 data pairs from the USGS National Water Information System database. The USGS concluded from the statistical analyses of the paired samples that the data produced by the SSC technique is more reliable than data produced by TSS analysis. The conclusions of this USGS study can be summarized as follows:

- TSS analysis is normally performed on an aliquot of the original water sample. The difficulty in withdrawing an aliquot from a sample that truly represents suspended material concentration leads to inherent variability in the measurement. By contrast SSC analysis is performed on an entire water sample, thus measuring the entire sediment mass in the sample. The analytical procedures for SSC and TSS differ and at times produce considerably different results, particularly when sand-size material composes a significant percentage of the sediment in a sample.
- TSS methods and equipment differ among various laboratories whereas SSC methods and equipment used by USGS sediment laboratories are consistent and are quality assured by the National Sediment Laboratory Quality Assurance Program.
- Results of the TSS analytical method tend to produce data that are negatively biased by 25% to 34% with respect to SSC analyses collected at the same time and can vary widely at different flows at a given site. The biased TSS data can result in errors in sediment load computations of several orders of magnitude.

For all of the reasons stated above, ADEQ adopted the following water quality standard for suspended sediment concentration:

D. The following water quality standard for suspended sediment concentration, expressed as a geometric mean (four-sample minimum), shall not be exceeded. The standard applies to a surface water that is at or near base flow and does not apply to a surface water during or soon after a precipitation event:

A&Wc, A&Ww

80 mg / L

Nutrient criteria [R18-11-109(H)]

R18-11-109(H) prescribes water quality standards for total phosphorus, total nitrogen, and limits on the discharge of total phosphates for a number of major rivers, their tributaries, and lakes in Arizona. The listed streams include the Verde River, Black River, Tonto Creek, Salt River, Little Colorado River, South Fork of the Little Colorado River, Colorado River, San Pedro River, Show Low Creek, Water Canyon Creek, and the San Francisco River. The lakes include Roosevelt, Apache, Canyon, and Saguaro lakes. The current criteria for nutrients are expressed as annual means, 90th percentile values, and single sample maximum concentrations. ADEQ did not change the current nutrient criteria in this triennial review. However, ADEQ expects that the development of revised nutrient criteria for streams and lakes will be a major issue in the next triennial review.

An initiative to address nutrient enrichment problems in the nation's waters was published in the Clean Water Action Plan in February, 1998. The Clean Water Action Plan states that EPA will establish numeric criteria recommendations for nutrients (that is, total nitrogen and total phosphorus) in 2000. The federal nutrient criteria recommendations are tailored to reflect different types of water bodies (for example, lakes, rivers, and estuaries) and different ecoregions of

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the country. The Clean Water Action Plan states that EPA will assist states to adopt numeric water quality standards for nutrients based on the EPA's criteria recommendations. EPA expects to develop numerical ranges for acceptable levels of nitrogen and phosphorus in surface waters based upon the water body type and the region of the country in which the surface water is located. EPA also expects the states to adopt numeric water quality standards for nutrients within three years of EPA issuance of recommendations for nutrient criteria. EPA has stated its intention to federally promulgate nutrient criteria if a state fails to adopt a water quality standard for nutrients appropriate to their region and water body types.

EPA recently published notice of the availability of 17 ecoregional nutrient criteria documents for lakes, streams and rivers, and wetlands in eight ecoregions in the United States. In the notice of availability of the nutrient criteria documents, EPA restated its expectation that the states will use the ecoregional nutrient criteria recommendations as "starting points" to identify more accurate, site-specific nutrient criteria for surface waters located within the states. EPA expects states to develop a plan for the development of numeric nutrient criteria for its surface waters by the end of 2001 and to adopt or revise numeric nutrient criteria for surface waters by 2004. ADEQ will consider revisions to the current nutrient criteria in the next triennial review of water quality standards.

Salinity of the Colorado River [R18-11-110]

R18-11-110 prescribes flow-weighted average annual salinity standards for three control points on the lower Colorado River. R18-11-110 requires that the flow-weighted average annual total dissolved solids concentration be maintained at or below 723 mg/L below Hoover Dam, 747 mg/L below Parker Dam, and 879 mg/L at Imperial Dam. ADEQ retained these salinity standards without change in this triennial review.

Arizona's numeric salinity standards are based upon water quality standards for salinity recommended by the Colorado River Basin Salinity Control Forum (Forum). The Forum conducts its own triennial review of the water quality standards for salinity. On May 27, 1999, the Forum approved the "Report on the 1999 Review, Water Quality Standards for Salinity, Colorado River System (June, 1999)." On October 27, 1999, the Forum approved a Supplemental Report to its 1999 Review. The 1999 Review and the Supplemental Report constitute the Forum's triennial review of the water quality standards for salinity of the Colorado River system. The Forum's final report and supplement were transmitted to Governor Hull by letter dated December 3, 1999 urging prompt state adoption of the Salinity Control Forum's salinity criteria and the plan of implementation by Arizona's water quality control agency.

The Forum recommended no change to the current numeric salinity criteria that have been established for the three control points on the Colorado River at Hoover, Parker, and Imperial dams. These criteria are incorporated into Arizona's surface water quality standards rules in R18-11-110. No change has been made to the numeric salinity criteria since their original adoption by the Forum in 1975. ADEQ reviewed the Forum's 1999 Review and concurs that there is no need to modify the numeric criteria for salinity that are in R18-11-110 in this triennial review.

The Forum's water quality standards for salinity consist of the numeric salinity criteria and a plan of implementation for salinity control for the Colorado River system. The plan of implementation is designed to meet the objective of maintaining the salinity concentrations at or below the numeric criteria at the three stations located on the lower mainstem of the Colorado River. The legal basis for the inclusion of a plan of implementation as an element of the Forum's water quality standards for salinity appears to date back to the Water Quality Act of 1965. Under the Water Quality Act of 1965, water quality standards consisted of three basic elements: 1) a designated use, 2) water quality criteria expressed in numeric or narrative form sufficiently stringent to protect the designated use, and 3) a plan of implementation and enforcement of the water quality criteria [See § 10(c)(1), 79 Stat. 907, 33 U.S.C. § 1160(c)(1)]. The inclusion of a plan of implementation as a required element of water quality standards was deleted in the Clean Water Act of 1972. § 303(c) of the Clean Water Act removed the plan of implementation as a required element of water quality standards [See *EDF v. Costle*, 657 F. 2nd 275 (D.C.Cir. 1981)].

While a plan of implementation is no longer a required element of a state water quality standards under § 303(c), ADEQ amended R18-11-110 to incorporate by reference the Forum's plan of implementation for salinity control. The plan of implementation includes: 1) completion of Bureau of Reclamation, Bureau of Land Management (BLM), and U.S. Department of Agriculture salinity control measures to the extent that each unit remains viable and cost-effective, 2) implementation of the Forum's recommended policies for effluent limitations, principally under the NPDES permit program. These policies include the following: "Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program," "Policy for the Use of Brackish and / or Saline Waters for Industrial Purposes," "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Ground Water," and "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Fish Hatcheries," and 3) implementation of nonpoint source management plans developed by the states and approved by EPA. The policies are designed to ensure compliance with the numeric criteria for salinity at the control points on the lower Colorado River. During each triennial review of the Forum's water quality standards for salinity, the numeric criteria for salinity are reviewed and the plan of implementation is updated as necessary to ensure compliance with the numeric criteria.

The Colorado River water quality standards for salinity and the approach taken by the basin states to salinity control are unique. Arizona strongly supports the efforts of the Forum and its salinity control activities in the Colorado River basin, including the plan of implementation. For this reason, ADEQ added a subsection (B) to R18-11-110 to adopt the plan of implementation for salinity control:

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- B. To preserve the basin wide approach to salinity control developed by the Colorado River Basin states and to ensure compliance with the numeric criteria for salinity set forth in subsection (A), the Department adopts the plan of implementation contained in the "1999 Review, Water Quality Standards for Salinity, Colorado River System." Colorado River Basin Salinity Control Forum 106 West 500, Suite 101, Bountiful, Utah 84010-6232 (June, 1999), which is incorporated by reference and on file with the Office of the Secretary of State and the Department. This incorporation by reference contains no future editions or amendments.

Unique Waters [R18-11-112]

R18-11-112 prescribes the rules that govern the state's unique waters program. A unique water is a surface water that ADEQ has determined to be an outstanding state resource water. Currently, there are 10 unique waters in Arizona:

1. West Fork of the Little Colorado River above Government Springs;
2. Oak Creek, including the West Fork of Oak Creek;
3. Peeples Canyon Creek, a tributary to the Santa Maria River;
4. Burro Creek, above its confluence with Boulder Creek;
5. Francis Creek, in Mohave and Yavapai counties;
6. Bonita Creek, a tributary to the upper Gila River;
7. Cienega Creek, from I-10 to the Del Lago Dam in Pima County;
8. Aravaipa Creek, from the confluence with Stowe Gulch to the downstream boundary of the Aravaipa Canyon Wilderness Area;
9. Cave Creek and the South Fork of Cave Creek, in the Chiricahua Mountains; and
10. Buehman Canyon Creek, a tributary to the San Pedro River.

Unique waters are given stringent surface water quality protections under R18-11-107(D), the state antidegradation rule. R18-11-107(D) (as amended by this rule package) states:

Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as a unique water under R18-11-112. The Director shall not allow limited degradation of a unique water under [R18-11-107(C)].

Under Arizona's current antidegradation implementation guidelines, any proposed activity that results in a new or expanded discharge of pollutants *directly* to a unique water is prohibited. For example, a new or expanded point source discharge of pollutants (for example, a new wastewater treatment plant) directly to a unique water is prohibited by the state's Tier 3 antidegradation policy. The antidegradation implementation guidelines also prohibit a new or expanded discharge of pollutants upstream of a unique water or to a tributary to a unique water if the discharge would cause degradation of existing water quality in the downstream unique water.

A unique waters classification also can affect land use activities within a unique waters watershed. Land use activities that cause nonpoint source pollution are not exempt from the provisions of Arizona's Tier 3 antidegradation policy. For example, cattle grazing, mining, timber harvesting, agriculture, and other land uses that result in the nonpoint source discharge of pollutants to a surface water could be affected by a unique waters classification. Once a surface water is classified as a unique water, land use activities in the watershed have to be conducted in a way that prevents the degradation of existing water quality in the unique water. While Arizona does not have a regulatory program to directly control nonpoint sources of pollution, the intention of the Tier 3 antidegradation policy is that best management practices be developed and implemented to prevent the degradation of existing water quality in a unique water.

ADEQ classifies surface waters as unique waters by rulemaking. To classify a surface water as a unique water, ADEQ must go through the rulemaking process to amend R18-11-112 to add a new unique water to the list of 10 unique waters in R18-11-112(E). The legal requirements for the rulemaking process are prescribed in the State Administrative Procedures Act [A.R.S. § 41-1001 et seq.]. Those requirements must be followed to classify a surface water as a unique water [See R18-11-112(A)]. Rulemaking to classify a unique water usually takes place as part of the triennial review of the surface water quality standards rules.

Under R18-11-112, any person may nominate a surface water for classification as a unique water. The current rule outlines the nomination process in R18-11-112(C). A person who wants to nominate a surface water for unique waters classification must submit a nomination to ADEQ. The nomination must include: 1) a map and description of the candidate unique water, 2) a written statement in support of the nomination that includes a specific reference to one of the two grounds for unique water classification, 3) supporting evidence that one or more of the grounds for classification is met, and 4) available water quality data relevant to establishing baseline water quality conditions for the proposed unique water.

ADEQ may classify a surface water as a unique water if it meets one of the following criteria:

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1. The surface water is of exceptional recreational or ecological significance because of its unique attributes, including but not limited to attributes related to the geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics of the surface water, or
2. Threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species, or the surface water provides critical habitat for a threatened or endangered species.

The Director has discretion to classify unique waters. R18-11-112(D) states that the Director *may* classify a surface water as a unique water if the Director finds that one or both of the grounds for classification are met. However, ADEQ is not required to classify a nominated surface water as a unique water even if both grounds for unique waters classification stated above are established. There are no guidelines in the current rule to guide the exercise of the agency's discretion in making this decision.

ADEQ decided to prescribe more specific eligibility criteria for a unique waters classification in the final rule. The current grounds for unique water classification are broad and general, especially the ground that provides for unique classification if a surface water is determined to be "of exceptional recreational or ecological significance because of its unique attributes." [See R18-11-112(D)(1)]. While the current rule provides examples of the types of unique attributes that may be considered by the ADEQ (that is, geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics), there are no criteria or guidelines in the rule for determining what constitutes *exceptional* recreational or ecological significance.

ADEQ established new requirements for a surface water that must be satisfied before it can be considered eligible for a unique waters classification. The new eligibility requirements are modeled on the eligibility requirements for rivers under the federal Wild and Scenic Rivers Act (Pub. L. 90-542 as amended, 16 U.S.C. 1271-1287). The Wild and Scenic Rivers Act appears to be one of the sources for the attributes listed in the "exceptional recreational or ecological significance" ground for unique waters classification. In fact, two of the attributes listed as examples in R18-11-112(D)(1), "wilderness characteristics" and "aesthetic values," are synonyms for "wild and scenic." The statement of intent in the preamble to the Wild and Scenic Rivers Act could serve as a mission statement for the state's current unique waters program. The preamble to the Wild and Scenic Rivers Act states:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, *possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values*, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

This language is similar to language used in the "exceptional recreational and ecological significance" ground for unique waters classification at R18-11-112(D)(1). R18-11-112(D)(1) states that a surface water may be classified as a unique water if the Director finds:

The surface water is of exceptional recreational or ecological significance because of its unique attributes including but not limited to, attributes related to the geology, flora, fauna, water quality, aesthetic values, or the wilderness characteristics of the surface water.

ADEQ added several eligibility requirements to the unique waters rule that are based on the Wild and Scenic Rivers Act. First, the final rule states that a surface water must be perennial to be eligible for a unique waters classification. That is, a surface water must flow continuously throughout the entire year. Ephemeral waters and intermittent surface waters are ineligible for unique waters classification.

Second, a surface water must be "in a free-flowing condition" to be eligible for a unique waters classification. "Free-flowing" means that a nominated surface water does not have impoundments, major diversions, channelization, rip-rapping, or other hydrological modifications *within the nominated surface water reach*. The intent of this requirement is to limit eligibility to surface waters that are essentially natural in character and that have not been significantly modified by man. ADEQ recognizes that Arizona is a state where there has been extensive hydrological modification of rivers and streams. In applying this eligibility criterion, the fact that a nominated surface water flows between impoundments does not necessarily preclude its satisfying the "free-flowing condition" eligibility requirement. Surface waters that flow between impoundments may be considered to be "free-flowing" provided conditions within the nominated reach meet the requirements stated above. For example, the Colorado River flows between several large impoundments in Arizona and the flow of the river is regulated by dams. The Colorado River between Lake Powell and Lake Mead would be considered "free-flowing" and eligible for unique waters classification because there are no impoundments, diversions, channelization, or other hydrological modifications within the reach of the Colorado River between the two lakes. Even though the flow of the river is regulated, it still satisfies the "free-flowing" eligibility requirement. An effluent-dependent water would be ineligible for unique waters classification because ADEQ does not consider an EDW to be "in a free-flowing condition." An EDW is entirely dependent on the continued point source discharge of treated wastewater. An EDW is not essentially natural in character. It is a manmade stream that could be eliminated completely if the source wastewater treatment plant ceased discharging treated wastewater.

Third, ADEQ proposes to require that a surface water have good water quality in order to be eligible for a unique waters classification. Good water quality means that existing water quality meets or is better than applicable water quality standards that have been established for recreation in and on the water and for the propagation of aquatic life. A surface water that is identified as an impaired surface water under § 303(d) of the Clean Water Act is ineligible for

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unique waters classification under the final rule. It should be noted that the adoption of this requirement will require the collection of water quality data at some point in the unique waters classification process to determine baseline water quality. The current rule requires a nominating party to submit *available* water quality data relevant to establishing the baseline water quality of a proposed unique water. ADEQ retained this requirement in the final rule and did not require that nominating parties collect data on existing water quality and submit that data as part of a nomination. ADEQ recognizes that a requirement to collect water quality data would impose a significant cost on nominating parties. Nonetheless, the collection of data on existing water quality is critically important to providing Tier 3 anti-degradation protection and to the practical implementation of the unique waters program. The primary benefit of a unique water classification is the maintenance and protection of existing water quality and the prohibition against degradation under Tier 3 of the antidegradation rule. Tier 3 antidegradation protection cannot be provided without data on existing water quality. If existing water quality data is unavailable for a nominated surface water, then it will have to be collected before a decision can be made on the proposal or the classification of a unique water.

Fourth, it must be shown in a nomination that at least one of the following grounds for unique waters classification is satisfied. A nominating party must provide sufficient information in a nomination that demonstrates either: 1) a federally-listed threatened or endangered species is associated with the surface water and the surface water is essential to the maintenance and propagation of the species, 2) the surface water provides critical habitat for a federally-listed threatened or endangered species, 3) the surface water is of "exceptional recreational ...significance" because of one or more outstanding attributes, or 4) the surface water is of "exceptional... ecological significance" because of one or more outstanding attributes.

Currently, R18-11-112(C) states that any person may nominate a surface water for consideration as a unique water by filing a petition for rule adoption with the Department. The current rule requires a person who nominates a surface water to submit a map and description of the surface water, a written statement in support of the nomination with specific reference to the applicable criteria for unique waters classification, supporting evidence demonstrating that one or more of the applicable criteria are met, and any available water quality data that is relevant to establishing baseline water quality of the proposed unique water.

ADEQ proposes to develop a substantive policy to provide more specific guidance on information requirements for unique waters nominations. A person who wants to nominate a surface water as a unique water will have to provide a map and a specific description of the nominated surface water. The description of the surface water must include information or data demonstrating that basic eligibility requirements are satisfied. First, the description must include information demonstrating that a nominated surface water is perennial. Second, the description of the surface water must include information upon which ADEQ may find that the nominated surface water is "in a free-flowing condition." The description of the nominated surface water should describe any impoundments, diversions, channel modifications, flood control structures, bridges, road crossings, rip-rapping, or other hydrological modifications. Third, the description should include available water quality data that demonstrates that existing water quality meets applicable water quality standards.

A nomination must include a detailed description of the characteristics that make the surface water a worthy addition to the unique waters program. If a surface water is nominated on the ground that threatened or endangered species are known to be associated with the surface water and existing water quality is essential to the maintenance and propagation of the threatened or endangered species, then the nomination must specifically identify the threatened or endangered species that is associated with the surface water and provide documentation that the species is listed as endangered or threatened by the Secretary of the Interior pursuant to § 4 of the Endangered Species Act [16 U.S.C. § 1533]. The presence of candidate or sensitive species are insufficient to support a unique waters nomination on this ground. A nomination must include information upon which a finding can be made that a threatened or endangered species is known to occur in the specific area of the nominated surface water. The mere presence of suitable habitat for a threatened or endangered species is insufficient by itself to support a unique waters nomination. If a surface water is nominated on the ground that it provides critical habitat for a threatened or endangered species, the nomination must include documentation that the nominated surface water is located within a specific geographic area designated as critical habitat by the Secretary of the Interior pursuant to § 4 of the Endangered Species Act.

If a nomination is based, in whole or in part, on the ground of exceptional recreational significance, the nomination should include information on the estimated level of recreational use and the quality of the recreation experience provided by the nominated surface water. In the preamble to the Notice of Proposed Rulemaking, ADEQ had proposed to require the use of an assessment methodology developed for the Arizona River Assessment Project (ARAP) to evaluate exceptional recreational significance for the unique waters program. ADEQ has reconsidered this proposal and has decided **not** to specifically require the use of ARAP assessment forms. However, ADEQ still intends to use the ARAP methodology as a guide for evaluating surface waters as recreation resources to determine whether they are of "exceptional recreational significance." The ARAP methodology assigns streams into one of five classes for recreation: outstanding, substantial, moderate, limited, or unknown. These ratings are based on an assessment of the surface water's statewide significance as a recreation resource. An outstanding rating means that a surface water is an exceptional recreational resource as compared to other surface waters in the state. An outstanding surface water provides one of the highest quality recreational experiences available within the state due to its unique combination of attributes or one or more specific characteristics that create an exceptional recreation opportunity. A substantial rating means that a surface water is an important recreational resource that represents one of the finer examples in the state in terms of providing a quality recreational experience. A moderate rating means that the surface water may be con-

sidered average or standard when compared to the recreational experiences provided by other surface waters within the state. A surface water that is rated moderate for a recreational activity is similar to many other surface waters in the state. A limited rating means that the recreational value of the surface water is limited. A surface water that is limited for a recreational activity either does not permit recreational activities or the surface water does not provide a quality recreational experience as compared to other surface waters in the state. An unknown rating means that information on the quality of the recreational opportunity provided by the surface water is unavailable.

ADEQ thinks that the ARAP methodology and evaluation system is a useful model for ADEQ to follow in making unique water determinations based on “exceptional recreational significance.” ADEQ thinks it is appropriate to consider only those surface waters that are outstanding recreation resources as compared to other surface waters in the state for unique waters classification.

ADEQ did not prescribe specific information requirements in the final rule relating to the determination of exceptional recreational significance. However, ADEQ strongly encourages the submittal of information on the types, level of use, and the quality of water-dependent and stream corridor-related recreational activities, including fishing, boating, water play (for example, swimming, wading, tubing, and floating), camping, picnicking, hiking, nature study, and visiting historic or cultural sites when nominations are submitted to ADEQ. Specific and complete information of this type is important if a nominator cites “exceptional recreational significance” as one of the grounds for a unique water nomination. ADEQ can provide recreation resource assessment forms from the ARAP methodology as guidance to persons who may want to nominate a surface water for unique waters classification because it is of “exceptional recreational significance.” While submittal of information on the ARAP assessment forms is *not* required, the information provided on the forms will be useful to both the nominator and to ADEQ when ADEQ is asked to make a decision on whether to propose a nominated water as a unique water because it is of “exceptional recreational significance.”

If a nomination is based, in whole or in part, on the ground that a surface water is of “exceptional ecological significance,” the nomination must include information on the outstanding natural attributes that make the surface water “of exceptional ecological significance.” ADEQ hopes to clarify the evaluation criteria that ADEQ intends to use to determine whether a surface water is of “exceptional ecological significance” in this preamble. Again, ADEQ proposed to use the ARAP methodology to assess whether surface waters are of exceptional ecological significance because of their riparian vegetation, fish, wildlife, stream hydrology, or geology in the Notice of Proposed Rulemaking. While the final rule does not prescribe specific information requirements or require the use of ARAP forms, ADEQ strongly encourages their use.

The following section of the preamble is intended to guide nominators on ADEQ’s interpretation of the meaning of the phrase “exceptional ecological significance.” This part of the preamble is presented to explain ADEQ’s thinking and its approach to making decisions as to whether a stream is of exceptional ecological significance. It is not intended and should not be interpreted as prescribing specific information requirements that must be met by nominators of unique waters.

A surface water may be of exceptional ecological significance because it has an outstanding riparian community associated with it. To make this determination ADEQ will evaluate information about the plant species and plant communities associated with a surface water, the existing and potential extent or coverage of riparian vegetation, and a description of the ecological functions of the riparian corridor. ADEQ will consider the following criteria when assessing whether a surface water is of exceptional ecological significance because it has an outstanding riparian community: the presence of threatened, endangered, and candidate plant species; the estimated length, width, and acreage of the riparian area or riparian community; the dominant vegetation community; species diversity; the relative scarcity of the riparian community within the state, the relative predominance of native vegetation as compared to introduced vegetation, and whether the riparian community is in proper functioning condition.

A surface water may be of exceptional ecological significance because it is an outstanding fishery. If the fishery resource is cited as one of the grounds for a unique waters nomination, ADEQ will evaluate information to make an assessment as to whether the surface water has an outstanding fishery of statewide significance. To make this determination, ADEQ encourages submittal of information about the fish species present; the relative statewide significance of the fish species present; population origin (that is, native, reintroduced native, introduced, stocked), estimated population size and its sustainability; and the overall condition of the fish habitat provided by the nominated surface water. ADEQ will evaluate two broad categories of fish species: native fish and sport fish. Both categories of fish have resource values and should be evaluated independently. ADEQ can provide a checklist of 74 fish species used by the Arizona Game and Fish Department to help nominating parties inventory fish species that are present in a nominated surface water. ADEQ will give relatively greater weight to the presence of native fish species in a nominated surface water. Native fish species significance is based on the presence or absence of threatened, endangered, or candidate fish species in a nominated surface water and the extent of native fish predominance in the overall fish population. Sport fish significance will be evaluated on whether a fish species is rated as preferred, average, or of no value for fishing. ADEQ encourages submittal of available information on the present population size and population trends (increasing, stable, or decreasing) and whether fish populations are naturally-reproducing or hatchery-subsidized. Information that assists ADEQ in making a general assessment of fish habitat based on parameters such as habitat diversity, cover, water quality, and water quantity also would be helpful. ADEQ encourages the submittal of information on any special or unique habitat characteristics of a nominated surface water, such as it pro-

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vides critical spawning areas; it has exceptional or unusual habitat features such as oxbows, sloughs, backwaters; it has exceptional habitat diversity or a unique combination of habitat types; or the nominated surface water has a critical habitat designation or it is located within a special research or conservation area.

A surface water may be of exceptional ecological significance because it is an outstanding wildlife resource. Again, ADEQ proposes to use the ARAP methodology as a general guide to assessing whether a nominated surface water is of exceptional ecological significance because of its wildlife. Wildlife habitat varies as much as do the animals themselves. ADEQ recognizes that it is impossible to do a detailed assessment of the habitat value of a nominated surface water for each species that may be present. However, a general assessment of a stream's overall habitat value to wildlife may be performed to determine whether a stream is of exceptional ecological significance.

Wildlife resource assessment criteria include two broad categories: species and habitat. As a first step in assessing wildlife resource values, ADEQ will consider information on the wildlife species for which the stream corridor segment provides significant habitat. A nominating party should focus on wildlife species that are dependent upon the surface water and its riparian corridor, especially the identification of species of special concern that are of statewide significance. For example, the presence of federal or state-listed threatened or endangered species, species that are proposed for listing, candidate species, species identified by state or federal agencies as species of special concern, and species that are of special local importance and that are uncommon throughout the state. In general, wildlife species significance is measured by the relative rarity of the species or its perceived importance. Obviously, federally-listed threatened or endangered species are given the highest statewide significance. Next in significance are species of special local importance and species that are uncommon throughout the rest of the state. Species that are relatively common throughout the state are considered to be less significant. ADEQ will give relatively greater weight to the presence of aquatic species of special concern that are of statewide significance.

Information on habitat characteristics is useful to ADEQ in making a determination whether a stream is of exceptional ecological significance. Information on special habitat characteristics, including: unique wildlife activity areas that are critical to some element of a species' life cycle; unusual or exceptional habitat features; designated critical habitat for federally-listed threatened or endangered species; other critical habitat for threatened, endangered, sensitive, or other species of concern; the presence of designated wildlife areas; and special research areas will help ADEQ in making a decision on whether a nominated surface water merits unique water classification. Information on whether habitat characteristics are improving, stable, or declining and some assessment of the habitat's recovery potential (at or near potential, recovery through natural systems alone, recovery with reasonable management assistance, recovery with intensive assistance, and no recovery potential) is also helpful. An overall habitat value assessment of different habitat types (aquatic, marshes, wetlands, scrub lands, forests and woodlands) and whether the stream contains habitat that is of excellent or high quality, moderate quality, limited or low quality, none, or unknown. Information on habitat uniqueness or rarity also can be used to support a determination of "exceptional ecological significance."

A surface water may be of exceptional ecological significance because of its stream hydrology. Most of Arizona's streams are ephemeral waters that flow in direct response to precipitation or they are intermittent waters that flow seasonally or in wet years. The duration of flow in a stream is a primary concern because of the proposed eligibility requirement that a unique water be perennial. Ephemeral and intermittent waters are ineligible for unique waters classification. To be eligible for a unique waters classification, a nominating party must provide documentation that the nominated surface water flows continuously throughout the year. This can be shown in at least two ways. If empirical data is available from a USGS gaging station or other discharge monitoring, the mean monthly flow in cubic feet per second for each month of the year and the mean annual flow in cubic feet per second can be calculated and provided to ADEQ. If empirical data are unavailable, a nominating party can provide other information that a stream flows throughout the year. In the latter case, information on the amount and quality of the data that supports the assertion that a stream is perennial should be submitted (for example, field observations over a period of record, modeling, or best guess).

ADEQ amended the part of the current rule that states that unique waters nominations are made by petitions for rule adoption [See R18-11-112(C)]. ADEQ believes that petitions for rule adoption unnecessarily accelerate the decision-making process and short-circuit the careful study of surface waters nominated for unique waters classification. The unique waters rule should not impose unreasonably short time-frames that result in ADEQ decisions on the eligibility and suitability of nominated surface waters on the basis of limited information. Rather, the nomination of a surface water for unique waters classification should start a careful review process that can be accomplished by ADEQ within the larger time-frame of the triennial review of surface water quality standards.

Under the final rule, any person may submit a nomination of a surface water for consideration as a unique water. However, the submittal of a nomination does not trigger the immediate initiation of a rulemaking process. Instead, the nomination of a surface water will trigger an evaluation process by ADEQ that may take place outside of the formal rulemaking process. ADEQ will screen nominations for completeness and may solicit more information from nominators or schedule informal public meetings to solicit comment on complete nominations. ADEQ hopes that the end product of this process will be a more structured assessment of the eligibility and suitability of a nominated surface water by ADEQ and a recommendation for non-inclusion or inclusion in the unique waters program through a proposed revision to the unique waters rule.

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ADEQ amended the rule to clarify the public participation procedures that are to be used during the unique waters classification process. While the current rule does not require public participation beyond the public participation requirements that apply to rulemaking, it has been ADEQ practice to hold at least one informal public meeting in the area where a nominated unique water is located to present the unique waters nominations to persons in the local community who will be most directly affected by a nomination and to solicit public comment. ADEQ believes that this element of the informal public participation process for unique waters classification is important and it is included in the final rule.

ADEQ also added language to the rule to clarify that the formal process to classify surface waters as unique waters will take place as part of the triennial review of surface water quality standards. ADEQ is proposing this clarification to conserve agency administrative resources. The formal rulemaking process is resource-intensive and it can take a long time to complete, sometimes years. It is more efficient for ADEQ to formally consider unique waters classifications during the triennial review of the surface water quality rules.

ADEQ amended the rule to require consideration of whether there is an ability to manage a proposed unique water and its watershed to maintain and protect existing water quality. ADEQ believes that a management capability to maintain and protect existing water quality is an important factor in the decision to classify a unique water. The ability to manage for water quality was one of three primary criteria for designation of unique waters under the original unique waters policy for Arizona adopted in the early 1980's. The three primary designation criteria for a unique waters designation in the original policy were: 1) water quality is consistently better than water quality standards, 2) preservation of existing water quality is not in conflict with the present or anticipated necessary or justifiable economic and social uses of the watersheds consistent with appropriate planning such as § 208 area wide water quality management plans or county and municipal plans, and 3) *the body of water and its watershed are capable of being managed to maintain the existing high water quality* [See "Arizona Water Quality Control Council Unique Waters Policy," April 8, 1981, p. 2]. ADEQ amended R18-11-112 to reinstate management capability as a decision-making factor.

A nomination should include information on the current status of land ownership and existing land uses within 1/4 mile from each bank of the nominated surface water. ADEQ needs information on land ownership and land uses in the riparian corridor to make a judgment regarding whether there is an ability to manage the nominated unique water for water quality purposes. The submittal of this information also will assist ADEQ in making a judgment regarding the social and economic impact of a unique water nomination.

There is a need to more specifically describe the criteria that ADEQ will consider when making decisions on unique waters nominations. Additional decision criteria are needed to guide the exercise of agency discretion in the decision making process. The current rule states only that the Director *may* classify a unique water. At a minimum, a surface water that is nominated for unique waters classification must meet eligibility requirements and at least one of the grounds for unique waters classification. However, once one of the grounds is met, what factors should ADEQ consider before making a decision whether to classify a nominated surface water as a unique water? ADEQ believes that additional decision criteria are necessary to guide the exercise of ADEQ's discretion in the decision-making process.

Decision criteria that the Director may consider include:

Social and economic impact of Tier 3 antidegradation protection: The Director may take into consideration the potential social and economic impact of a unique water classification and the establishment of Tier 3 antidegradation protection, including the:

- a. Impact of a prohibition of new point source discharges and expansion of existing point source discharges, including possible limits on discharges to the tributaries of a proposed unique water and possible impacts on growth and development;
- b. Impact of possible future restrictions on land use activities in a unique waters watershed, including cattle grazing, timber harvesting, mining, recreation, and agriculture;
- c. Impact of stricter requirements for § 401 certification of federal permits and licenses, including NPDES and § 404 permits;
- d. Impact on private property rights and the potential for regulatory "takings;" and
- e. Ecosystem and preservation values.

ADEQ is required by law to classify unique waters by rule. One of the requirements of the rulemaking process is the preparation of an economic, small business, and consumer impact statement (EIS). Any rule establishing a new unique water is subject to review by the Governor's Regulatory Review Council (GRRC). The GRRC cannot approve a rule establishing a new unique water unless there is a complete EIS, the EIS is "generally accurate," and the probable benefits of a unique waters classification outweigh the probable costs of the rule. The Director may consider the availability of information to develop an adequate economic impact statement in making a decision on a unique waters nomination. Where information is available on the probable costs and benefits of a unique waters classification, the Director may take that information into account in making a decision whether to go forward with a unique waters proposal. Where probable costs of a unique waters classification outweigh the probable benefits, the Director may deny a nomination.

• *Public comments in support or opposition to a unique waters classification:* The Director will consider public comments and the degree of support or opposition to a unique waters classification. While a unique waters classification is not subject to majority vote, ADEQ will carefully consider all of the public comments that are submitted on a proposed unique water. ADEQ will carefully consider the comments of the federal and state land management agencies that have primary responsibility for managing public lands where a proposed unique water is located. Such agencies may include the U.S. Forest Service, Bureau of Land Management (BLM), National Park Service, State Land Department, and Arizona State Parks. This decision criterion closely relates to the determination as to whether there is an ability to manage the proposed unique water and it recognizes the need for intergovernmental cooperation between ADEQ's unique water program and federal and state land managers and other natural resource management agencies [for example, U.S. Fish and Wildlife Service and the Arizona Game and Fish Department].

• *Location:* The Director may consider whether the proposed unique water is located within a National or State Park, National Monument, National Recreation Area, Wilderness Area, National Wildlife Refuge, Area of Critical Environmental Concern, Riparian National Conservation Area, or is designated or proposed for designation as a Wild and Scenic River.

• *Agency resource constraints:* A unique waters classification provides Tier 3 antidegradation protection [See R18-11-107(D)]. To make Tier 3 antidegradation protection meaningful, a water quality monitoring program must be implemented to determine existing water quality and whether degradation is occurring. The Director may consider whether there is an ability to monitor water quality in a proposed unique water before classifying it. ADEQ also will consider the potential for cooperative agreements with other agencies (USGS, USFS, BLM) and the availability of volunteer monitoring groups before making a decision to propose a surface water as a unique water.

Unique water nominations

ADEQ received nominations of 37 surface waters for consideration as unique waters in this triennial review. ADEQ held six public meetings in Alpine, Flagstaff, Cascabel, Phoenix, and Globe to discuss the nominations with persons in locally affected communities. All 37 surface waters that were nominated were included in a set of preliminary draft rules that ADEQ distributed for public comment. ADEQ held four additional public meetings to take public comments on the preliminary draft rules, including the unique waters nominations. ADEQ considered all of the public comments that were received on the nominations before making a decision of which surface waters to formally propose for unique waters classification in a Notice of Proposed Rulemaking. ADEQ classified nine surface waters as unique waters:

Little Colorado River watershed

1. Lee Valley Creek (above Lee Valley Lake)

Salt River watershed

2. Bear Wallow Creek
3. North Fork of Bear Wallow Creek
4. South Fork of Bear Wallow Creek
5. Snake Creek
6. Stinky Creek
7. Hay Creek

Santa Cruz River watershed

8. Upper Cienega Creek

Upper Gila River watershed

9. KP Creek

ADEQ decided **not** to propose the following surface waters that were nominated for unique waters classification:

Little Colorado River watershed

1. Dry Lake
2. Coyote Creek
3. Mamie Creek

Salt River watershed

4. Reavis Creek (Superstition Wilderness)
5. Pine Creek (Superstition Wilderness)
6. Tortilla Creek (Superstition Wilderness)
7. Fish Creek (Superstition Wilderness)

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8. La Barge Creek (Superstition Wilderness)
9. Pinto Creek
10. Lower Haunted Canyon
11. Conklin Creek (Black River watershed)
12. Corduroy Creek (Black River watershed)
13. Double Cienega Creek (Black River watershed)
14. Fish Creek (Black River watershed)
15. Hannagan Creek (Black River watershed)
16. Boggy Creek (Black River watershed)
17. Centerfire Creek (Black River watershed)
18. Wildcat Creek (Black River watershed)
19. Home Creek (Black River watershed)
20. Reservation Creek (Black River watershed)
21. Soldier Creek (Black River watershed)
22. West Fork of the Black River
Upper Gila watershed
23. Coleman Creek (Blue River watershed)
24. Grant Creek (Blue River watershed)
San Pedro River watershed
25. Hot Springs Canyon
26. Bass Canyon
27. Redfield Canyon
28. Wildcat Canyon Creek

Of the nominations that ADEQ decided not to propose for unique water classifications, two were particularly controversial. They were the nominations of Pinto Creek and Lower Haunted Canyon Creek.

Pinto Creek unique water nomination

In August, 1999, Mr. Tom Sonandres, on behalf of the Friends of Pinto Creek, nominated an 8.8 mile segment of Pinto Creek for unique waters classification. Pinto Creek is a perennial stream that flows through the Sonoran desert in Gila County near Globe, Arizona. The nominated segment of Pinto Creek is located primarily within the Tonto National Forest. Pinto Creek is ephemeral in its upper reaches but it flows perennially in several reaches between its headwaters in the Pinal Mountains and Roosevelt Lake. The nominated segment of Pinto Creek extends from approximately the Pinto Valley Mine weir to the lower end of an area called the Pinto Box.

ADEQ determined that the nominated segment of Pinto Creek is perennial. This description is supported by stream flow or stream discharge information provided by the U.S. Forest Service in a preliminary analysis of Pinto Creek that was done to determine its eligibility for potential inclusion in the Wild and Scenic River system and by U.S. Geological Survey Water Resources Data. The U.S. Forest Service describes the nominated segment as being “mostly perennial” with a median flow over 5-year period of record of 2.1 cubic feet per second (cfs). USGS discharge records from October, 1994 - 1999 obtained from the stream gaging station at the Pinto Valley weir also indicate that the nominated section of Pinto Creek is perennial. The annual mean discharge in cubic feet per second ranges from .38 cfs to 27.3 cfs, the minimum discharge ranges from .01 cfs to 1.3 cfs, and the maximum discharge ranges from 19 cfs to 5010 cfs. Discharge data over the period of record indicate that the nominated segment of Pinto Creek is perennial even though there can be very low flow in the stream in dry years.

Lower Pinto Creek was nominated for consideration as a unique water on the ground that the stream is of exceptional ecological significance because of the presence of perennial water in the Sonoran desert environment; the presence of more than 20 endangered, threatened, or sensitive species; its outstanding cottonwood-willow riparian corridor, and its geological features. Lower Pinto Creek also was nominated for its outstanding scenic values. Pinto Creek supports a cottonwood-willow riparian community. The U.S. Forest Service identified Pinto Creek as having “outstandingly remarkable” ecological values because of its cottonwood-willow riparian community, described as the rarest riparian community on the Tonto National Forest. The U.S. Forest Service also identified Pinto Creek as having outstandingly remarkable riparian values based on a 1993 evaluation of the stream’s riparian condition. The condition of the riparian community was described as “only fair” on the upstream half of the segment of Pinto Creek that was being evaluated for eligibility and classification as a Wild and Scenic River. The condition of the riparian community in the lower

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half of the segment was described as good where no livestock grazing had occurred in several years. The Tonto National Forest also noted that the riparian area had high value as a benchmark for documenting the recovery of the rare cottonwood-willow riparian community and that the trend for the riparian community was improving. More recent information on the status of the riparian community for Pinto Creek was not included in the nomination other than a brief note reporting personal observations of the nominator that he observed dense thickets of young cottonwoods during a June, 1999 hike.

Pinto Creek was nominated for unique waters classification, in part, because Lower Pinto Creek provides moderate to good riparian habitat for a variety of threatened, endangered, or sensitive species that may be present in the nominated reach. However, the availability of suitable habitat and the assertion that threatened or endangered species *may* be present are insufficient to support a unique waters classification under the current R18-11-112(D)(2). There is insufficient information in the nomination document for ADEQ to make a finding that threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species.

The federally-listed endangered or threatened species identified in the nomination are the bald eagle, southwestern willow flycatcher, the lesser long-nosed bat, and the Arizona hedgehog cactus (the other identified species are either candidate or Forest Service-sensitive species). The four federally-listed species that are identified are only weakly associated with Pinto Creek and there was no showing that the maintenance and protection of existing water quality in Lower Pinto Creek was essential to the maintenance and propagation of the species. For example, the nomination document states that neither bald eagles or the southwestern willow flycatcher have been observed along Pinto Creek but that bald eagles may fly over lower Pinto Creek in search of prey and the southwestern willow flycatcher may find suitable habitat if willows recover from flooding to form dense thickets. The only information provided in the nomination document regarding the lesser long-nosed bat is a statement that the U.S. Fish & Wildlife Service believes that the bat may be in the area. The Arizona hedgehog cactus is only weakly associated with the Pinto Creek riparian community. Its habitat is described as the ecotone between interior chaparral and madrean evergreen woodlands. It grows on open slopes, in narrow cracks between boulders, and in the understory of shrubs. It is difficult to conclude that a unique waters classification of Pinto Creek is essential to the maintenance and protection of the Arizona hedgehog cactus given these habitat requirements. Moreover, the presence of threatened or endangered species in Pinto Creek is contradicted by conclusions of the final environmental impact statement (EIS) for the Carlota Mine Project. Extensive studies on the presence of threatened or endangered species were done as part of the EIS. The final EIS document concludes that special status wildlife species or other wildlife species of concern "are not located in the vicinity of the Carlota project area and / or suitable habitat is not present" [See p. 3-189 of the EIS]. It also should be noted that Pinto Creek has *not* been designated as a critical habitat under the Endangered Species Act for any federally-listed threatened or endangered species. For all of these reasons, ADEQ concluded that Pinto Creek did not qualify for unique water classification on the basis of its known association with threatened or endangered species.

ADEQ determined that Lower Pinto Creek did not qualify for unique water classification on the ground that the stream is of exceptional recreational significance. Public access to the nominated reach of Pinto Creek is limited. There are no developed recreation facilities or trails within the nominated segment. Recreational activities are limited to dispersed recreation activities such as hiking, nature study, picnicking, and horseback riding. In 1993, the Tonto National Forest estimated that only 1,500 recreation visitor days occurred within the area of the nominated segment annually. This level of recreational use does not support a finding that Pinto Creek is one of Arizona's exceptional recreation resources. Finally, the Arizona River Assessment Project, in an independent assessment of Pinto Creek, rated the stream as a limited recreation resource. The Arizona River Assessment Project defines "limited" recreation resource as one where "recreational values are limited, and do not offer as high a quality of recreation experience or uniqueness of experience within the state as the other value classes."

The nomination document notes that Lower Pinto Creek was included in a U.S. Forest Service study of rivers and streams potentially eligible for inclusion in the national Wild & Scenic Rivers System. In January, 1993, the U.S. Forest Service evaluated Pinto Creek in Preliminary Analysis of Eligibility and Classification for Wild / Scenic / Recreational River Designation Report. Resource information for Pinto Creek was published in a report entitled, Resource Information Report, Potential Wild / Scenic / Recreational River Designation, National Forests of Arizona, U.S. Department of Agriculture, U.S. Forest Service, Southwestern Region, September, 1993. Based on this preliminary analysis, the U.S. Forest Service found that Pinto Creek was eligible for inclusion in the national Wild & Scenic Rivers System as a scenic river and that it possessed outstandingly remarkable scenic, riparian, and ecological values. It should be noted that while the U.S. Forest Service made a preliminary determination that Pinto Creek was eligible for inclusion in the Wild and Scenic Rivers system, the stream has not been so designated.

The Pinto Creek watershed contains areas of known natural copper mineralization that have been exploited by past and present mining activities. Pinto Creek flows across the western margin of the historic Globe-Miami mining district, one of the major porphyry copper districts in the Southwest. Mining activities in the Pinto Creek watershed have created point and nonpoint source pollution sources that have contributed copper to Pinto Creek and its tributaries. These mining activities include open pit copper operations, several historic open-pit and underground operations, and hundreds of smaller adits, shafts, and prospects. Pinto Creek has been affected by numerous spills from the Pinto Valley Mine over the past 25 years, the latest resulting from a massive tailings failure in 1998. A remedial action under CERCLA (the federal Superfund program) was initiated against BHP Copper to clean up Pinto Creek.

Pinto Creek is listed by ADEQ under § 303(d) of the Clean Water Act as a water quality-limited surface water for non-attainment of the surface water quality standard for dissolved copper. Under § 303(d), a total maximum daily load (TMDL) analysis must be developed for all impaired surface waters on the § 303(d) list. A draft TMDL for copper in Pinto Creek has been completed [See “Total Maximum Daily Load for Copper in Pinto Creek,” Arizona, Environmental Protection Agency and Arizona Department of Environmental Quality, Public Review Draft, July, 2000]. The geographic scope of the TMDL includes the entire Pinto Creek watershed from its headwaters to Roosevelt Lake, including the reach of Pinto Creek nominated for classification as a unique water.

ADEQ agrees with the nominators that Pinto Creek has important natural resource values because of the presence of perennial water and the relatively rare cottonwood-willow riparian community that the stream supports. However, ADEQ decided not to propose Pinto Creek for unique waters classification primarily because the stream is water quality-limited for dissolved copper and the stream is listed on Arizona’s § 303(d) list. ADEQ believes that the listing of a surface water as an impaired water under § 303(d) of the Clean Water Act is inconsistent with a unique waters classification. The unique waters program recognizes the state’s outstanding state resource waters. ADEQ does not believe that surface waters with impaired water quality can reasonably be considered eligible for recognition as one of Arizona’s outstanding state resource waters.

Lower Haunted Canyon unique water nomination

Mr. Tim Flood, on behalf of the Friends of Arizona Rivers, nominated a 0.7 mile segment of Lower Haunted Canyon for classification as a unique water in August, 1999. The nomination states that Lower Haunted Canyon is an outstanding state resource water of exceptional ecological and recreational significance because of its unique attributes, including its regional importance as a perennial stream in the Sonoran desert, its relatively good water quality, its biological uniqueness (particularly its high quality riparian vegetation and the presence of numerous species of insects, amphibians, fish, reptiles, birds and mammals), the stream’s geomorphology (especially its relatively high percentage of pool habitat), and its scenic and aesthetic values.

ADEQ agrees that Lower Haunted Canyon is a valuable surface water resource and that it is an ecologically significant, perennial, desert stream. However, ADEQ does not agree that the stream possesses the outstandingly remarkable and unique attributes that qualify it as one of Arizona’s outstanding state resource waters of exceptional ecological significance. Lower Haunted Canyon may be a significant surface water resource on a local or even a regional scale. However, in ADEQ’s best professional judgment, Lower Haunted Canyon does not possess outstanding attributes that set it apart as a surface water of statewide significance. No federally-listed threatened or endangered species are documented to occur in Lower Haunted Canyon, nor is it designated as a critical habitat for a threatened or endangered species. The nomination document notes that both exotic fish species and native fish species are present in Lower Haunted Canyon. ADEQ considered the absence of threatened or endangered species and the presence of non-native fish species in Lower Haunted Canyon (for example, green sunfish) in determining the relative ecological significance of the stream as compared to other surface waters in the state. The nomination of Lower Haunted Canyon states that the stream provides suitable habitat for the Gila topminnow and Gila chub, two federally-listed endangered species. However, a finding that a surface water may provide suitable habitat is not, by itself, enough to support a unique waters classification.

The presence of green sunfish in Lower Haunted Canyon suggests that active fishery management by the Arizona Game and Fish Department (AGFD) may be necessary for Lower Haunted Canyon to achieve its potential as a native fishery for the Gila topminnow or Gila chub. AGFD provided comments to ADEQ on the unique waters nominations and stated their concern that a unique waters designation may impair the AGFD’s ability to manage the fishery resource in Lower Haunted Canyon. The AGFD notes in their comments that it is sometimes necessary to alter stream morphology to improve fish habitat (for example, construction of fish barriers, stream bank stabilization, installation of check dams, etc.) or apply piscicides such as rotenone or antimycin to remove non-native fish to aid in the recovery of threatened and endangered species (for example, the eradication of green sunfish). While a unique waters classification does not necessarily preclude such fishery management activities, ADEQ factored the need to conduct such activities into its decision whether to classify Lower Haunted Canyon as a unique water. The case for a unique water classification of Lower Haunted Canyon would be much stronger if the stream was renovated and a native fishery for the Gila topminnow or Gila chub was established.

Lower Haunted Canyon does not qualify for unique waters classification on the ground that it is of exceptional recreational significance. Public use and access to the stream are limited. The nomination document itself notes that Lower Haunted Canyon is only a “lightly used recreational area.” Moreover, an independent evaluation of Lower Haunted Canyon conducted as part of the Arizona Rivers Assessment Project described Haunted Canyon as being only a limited recreation resource that does not offer a high quality or unique recreational experience within the state when compared to other surface waters in the state.

Finally, ADEQ considered the comments of the U.S. Forest Service, the primary federal land management agency for the Tonto National Forest where Lower Haunted Canyon is located. The Tonto National Forest opposed the unique waters classification for Lower Haunted Canyon because it may interfere with mitigation measures agreed to by the U.S. Forest Service, the Carlota Copper Company, U.S. Environmental Protection Agency, Arizona Department of Water Resources, U.S. Army Corps of Engineers, and ADEQ in the final Environmental Impact Statement (EIS) for the Carlota Mine Project. One of the mitigation measures (WR-3 in the final EIS) developed by the Tonto National Forest and agreed to by the Carlota Copper Company is a measure to maintain stream flow in Haunted Canyon. The

mitigation measure calls for diverting water from a water supply well field and discharging it to Haunted Canyon. Water quality data provided from the water supply well field indicates that the groundwater has a similar water chemistry to surface water in Haunted Canyon. However, some differences in water quality exist that could make it difficult to comply with Tier 3 antidegradation requirements. The classification of Lower Haunted Canyon as a unique water could be counterproductive because it may impair the implementation of the well field mitigation program to preserve existing stream flow in Lower Haunted Canyon. Two of the principal arguments for the nomination of Lower Haunted Canyon as a unique water are it is of exceptional ecological significance because of its outstanding riparian community and the presence of perennial water in a Sonoran desert environment. The maintenance of stream flow in Lower Haunted Canyon is essential to maintaining its riparian community. A unique waters classification that interferes with the implementation of a strategy to preserve in-stream flows in Haunted Canyon may do more harm than good. For this reason, ADEQ chose not to classify Lower Haunted Canyon as a unique water.

Forest Guardians Nominations

The Forest Guardians White Mountain Conservation League ["Forest Guardians"] nominated all of the Apache trout streams in the Black River, Blue River, and Little Colorado River watersheds for unique water classification. Forest Guardians nominated 22 streams in three watersheds primarily on the ground that the streams support populations of threatened, endangered, and sensitive wildlife species, particularly the Apache trout. Forest Guardians also recommended the 22 streams for unique water classification on the ground that the surface waters provide important recreational opportunities such as hiking, birding, nature study, camping, hunting, fishing, and horseback riding.

ADEQ does not disagree that nominated surface waters have important recreational values, but the nominations provide insufficient information upon which ADEQ could find that the nominated surface waters represent surface waters that present exceptional recreational opportunities of statewide recreational significance.

Forest Guardians recommended the 22 surface waters primarily because of the presence of a number of endangered, threatened, and sensitive species. Many of the species listed in the nomination documents are identified as sensitive bird, terrestrial, or plant species, but there was no information to show that the maintenance of existing water quality in the nominated surface waters was essential to the maintenance and propagation of the endangered, threatened, or sensitive species.

ADEQ considered public comments that were made in support and in opposition to the Forest Guardians nominations. In particular, ADEQ carefully considered the comments of the Apache Sitgreaves National Forest [ASNF], the federal agency with management authority over the public lands where the nominated surface waters are located. In 1994, the U.S. Forest Service conducted biological assessments and evaluations for an Apache Trout Habitat Improvement Project within the ASNF. The biological assessments provided information used to develop the current Apache Trout Recovery Plan for the ASNF.

The ASNF did not support the nominations of Conklin Creek, Corduroy Creek, Double Cienega Creek, Fish Creek, Hannagan Creek, Boggy Creek, Centerfire Creek, Wildcat Creek, Home Creek, Reservation Creek, or Soldier Creek in the Black River watershed. The ASNF did not support the nominations of Coleman Creek and Grant Creek in the Blue River watershed. Finally, the ASNF did not support the nominations of Coyote Creek and Mamie Creek in the Little Colorado River watershed. The reasons ASNF provided for not supporting a nominated surface water are various, but they include the following: 1) The stream does not provide exceptional Apache trout habitat or it only provides limited Apache trout habitat; 2) the stream is an intermittent stream; 3) The stream is impacted by roads or other nonpoint sources of pollution, and 4) the stream is partly on the Fort Apache Indian Reservation and the state and ASNF have no regulatory or management authority on tribal lands.

The ASNF supported the nominations of the following surface waters for unique waters classification:

1. Bear Wallow Creek (including the North and South Forks) - because it is located within the Bear Wallow Wilderness area and the stream provides high quality Apache trout habitat.
2. Snake Creek - because the stream is currently in good condition and it provides exceptional Apache trout habitat.
3. West Fork of the Black River - (headwaters to West Fork campground) because the headwaters are considered to be in an unaltered watershed condition and it provides high quality Apache trout habitat within the ASNF.
4. Hay Creek - because the stream is currently in good condition and has the potential of becoming exceptional Apache trout habitat. Much of the stream falls within the Hayground Research Natural Area.
5. Stinky Creek - because road closures and exclusionary fencing have improved this stream to good condition.
6. KP Creek - because the stream is currently in good condition and it has the potential of becoming exceptional habitat for Apache trout. Also, the stream has been designated to be a Gila trout recovery stream.
7. Lee Valley Creek - because it currently is in good condition and has the potential of becoming exceptional habitat for Apache trout. Its headwaters are in the Mt. Baldy Wilderness Area and cattle grazing has been eliminated from the reach.

ADEQ did not propose any surface water for unique waters classification that was not supported by the ASNF. ADEQ classified all of the surface waters listed above except the West Fork of the Black River as unique waters in this triennial review because of the presence of the endangered Apache trout or the streams provide exceptional habi-

tat for the Apache trout. Also, each of the above nominations is supported by the ANSF and the Arizona Game and Fish Department. Finally, the nominated surface waters are capable of being managed to maintain existing water quality. ADEQ decided not to classify the West Fork of the Black River because it is currently listed as an impaired water on the state's § 303(d) list.

Forest Guardians Superstition Wilderness Nominations

Forest Guardians nominated five streams in the Superstition Wilderness Area for classification as unique waters. The five streams are Reavis Creek, Pine Creek, Tortilla Creek, Fish Creek, and LaBarge Creek. Forest Guardians nominated the five streams because they provide habitat for a variety of wildlife species and because most of the riparian corridors are in a healthy, proper functioning condition. The nomination document does state that some of the riparian areas along these streams show impacts from past overgrazing. For example, Tortilla Creek is described as having been subjected to heavy livestock concentrations in the past. The nomination states that threatened, endangered, and sensitive wildlife are associated with the five streams and that they "rely on the wooded areas supported by the creeks or the creeks themselves, and therefore water quality is crucial for their survival and propagation." While the nomination document states that the five streams provide critical habitat for threatened, endangered and sensitive species, there is no documentation that critical habitat designations under § 4 of the Endangered Species Act [16 U.S.C. § 1533] include any of the five nominated streams. Also, the only federally-listed threatened and endangered species identified in the nomination document associated with the nominated streams are bird species that are weakly dependent on existing water quality in the nominated streams for their maintenance and survival.

ADEQ does not believe that an adequate case for unique waters classification has been made for the five streams in the Superstition Wilderness Area. This conclusion is shared by the Tonto National Forest, the primary federal land management agency with jurisdiction over the public lands where the five streams are located. Furthermore, as the Tonto National Forest notes in their public comments to ADEQ, unique waters designations are largely unnecessary because of the location of the streams within an established wilderness area that already provides an adequate level of protection for the ecological and recreational values of the nominated streams.

Dry Lake

The Friends of Dry Lake nominated Dry Lake for unique waters classification in July, 1999. Dry Lake is an intermittent wetland in an extinct caldera located west of the city limits of Flagstaff, Arizona. The U.S. Army Corps of Engineers designated approximately 45 acres of Dry Lake as jurisdictional wetland, although the size of the wetland fluctuates considerably with seasonal and precipitation cycles. The wetland lies within the San Francisco Volcanic Field. The only source of water for Dry Lake is drainage from the slopes of the caldera. From the 1940's to the early 1970's, a dairy farm operated within the caldera and a dike was constructed through the bed of Dry Lake. Evidence of this dike and the old dairy farm operations are visible today. At the time of the nomination, Dry Lake and a large part of the caldera were owned by the Flagstaff Ranch Golf Club. At the time the Dry Lake nomination was submitted to ADEQ, a private developer had plans to construct a residential development and golf course within the caldera.

The nomination document states that Dry Lake is an outstanding state resource water because of its rarity. The nomination document states that there are over 600 cinder cones in the San Francisco Volcanic Field and Dry Lake is one of the six cinder cones that contain a wetlands. The nomination states that a natural wetland like Dry Lake, a scarce water resource in northern Arizona, is of exceptional ecological significance because of its local importance to wildlife. The nomination cites the presence of three federally-listed or state-listed endangered or threatened bird species, including the bald eagle, peregrine falcon, and the Mexican spotted owl as qualifying Dry Lake for unique water status under the current R18-11-112(D)(2). Finally, the Friends of Dry Lake state in their nomination that Dry Lake is an outstanding state resource water because of its recreational significance and aesthetic appeal.

ADEQ disagrees that Dry Lake qualifies as one Arizona's outstanding state resource waters when compared to other surface waters statewide. While ADEQ agrees that a wetland within a caldera is relatively rare, ADEQ does not believe that Dry Lake is of exceptional recreational or ecological significance. Dry Lake's recreational significance is limited. At the time of the nomination, most of the caldera was privately-owned and public access to the caldera and Dry Lake was restricted. No water-based recreation is possible at Dry Lake. Recreational activities are limited to nature study, wildlife viewing, and hiking on adjacent public lands.

ADEQ disagrees that Dry Lake is a surface water of exceptional ecological significance for several reasons. First, Dry Lake is an intermittent wetland. Moreover, the Dry Lake bed has been hydrologically modified by the construction of a dike through and dredging activities when the dairy farm operated within the caldera. The caldera and Dry Lake do not exhibit wilderness characteristics because of these hydrologic modifications. The possible presence of the bald eagle, peregrine falcon, and Mexican spotted owl are insufficient to support a unique waters classification for Dry Lake. These bird species are only weakly associated with Dry Lake and the wetland cannot be characterized as *essential* to their maintenance and propagation. Dry Lake has not been designated as critical habitat for any federally-listed threatened or endangered species.

ADEQ also takes note that the Grand Canyon Trust purchased the caldera basin and Dry Lake from the Flagstaff Ranch Country Club and will preserve the area as open space. The purchase will effectively prevent the development of the golf course and residential housing within the caldera. This purchase effectively removes the threat of development and will preserve the aesthetic and recreational values of Dry Lake and the surrounding caldera. For all of these reasons, ADEQ decided not to propose Dry Lake as a unique water.

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Forest Guardians Santa Pedro River Watershed Nominations

Forest Guardians nominated four streams in the San Pedro River watershed for unique waters classification. Hot Springs Canyon, Bass Canyon, Redfield Canyon and Wildcat Canyon. These streams are located in Muleshoe Ecosystem located in the Galiuro Mountains in southeastern Arizona. The nomination document states that this ecosystem encompasses the Muleshoe Cooperative Management Area that is jointly managed by Bureau of Land Management, the U.S. Forest Service, and the Nature Conservancy.

Forest Guardians nominated the four streams for consideration as outstanding state resource waters because of the existence of perennial flow in each stream and because each one provides important recreational opportunities and wildlife resources. The nomination cites the presence of 29 endangered, threatened, candidate, and sensitive species of concern known to be associated with the proposed surface waters, including five native fish species.

ADEQ agreed that the nominated surface waters possess outstanding natural attributes that qualify them for unique waters classification. ADEQ has recognized their ecological significance by establishing biocriteria reference sites at three of the four nominated streams. ADEQ disagrees that the level of recreational use (1,700 - 1,800 visitors a year) supports a finding that the streams are of exceptional recreational significance. None of the nominated streams were rated as outstanding recreation resources by the Arizona River Assessment Project.

While the four streams may qualify as outstanding state resources on the ground that they are of exceptional ecological significance, ADEQ decided not to propose them for unique waters classification. The nominated streams are located in remote areas that are almost entirely within the boundaries of the Muleshoe Preserve. They are already being well managed to protect existing water quality and the outstanding natural attributes of their riparian corridors. A Muleshoe Ecosystem Management Plan is already in place to improve the nominated watersheds. The Muleshoe Ecosystem Management Plan was created in a joint effort with the cooperation of the Nature Conservancy, Bureau of Land Management, U.S. Forest Service, Arizona Game and Fish Department, neighboring ranchers, and private property owners. These parties, including the Nature Conservancy, which is principally responsible for preserving the natural resources and ecological values of the Muleshoe Preserve, oppose unique waters classification for the four nominated streams. The nominations also are opposed by the Redington Natural Resource Conservation District. ADEQ decided that a unique waters classification of the four streams was unnecessary and may limit implementation of some of the management tools that have been shown to be effective in watershed improvement under the Muleshoe Ecosystem Management Plan. In the absence of support for these nominations from the principal land management agencies, ADEQ decided not to propose the nominated streams for unique waters classification.

Peeples Canyon Creek

ADEQ received a request from the Arizona Office of the Bureau of Land Management (BLM) to review the existing classification of Peeples Canyon Creek as a unique water. The current unique waters listing of Peeples Canyon Creek is from its headwaters to its confluence with the Santa Maria River. BLM requested that ADEQ revise the current listing because it is inconsistent with the reach of Peeples Canyon Creek that BLM nominated for unique waters classification in 1985. BLM requested that ADEQ change the unique water listing to be consistent with the original nomination of a 1/4 mile segment of Peeples Canyon Creek associated with South Peeples Spring. This request is strongly opposed by a coalition of 10 environmental organizations who argue that the entire reach of Peeples Canyon Creek, including the headwaters of the creek around Sycamore Spring, deserves protection as a unique water. ADEQ included the BLM request in the preliminary draft rules and the agency solicited public comments on the request to amend the current listing of Peeples Canyon Creek to include only the 1/4 mile segment associated with South Peeples Spring.

ADEQ decided not to propose any changes to the current listing of Peeples Canyon Creek in the proposed rules for the following reasons:

1. Peeples Canyon Creek, from its headwaters to its confluence with the Santa Maria River, is currently listed as a unique water in R18-11-112. The revision of the listing to include only a 1/4 mile segment of the creek around South Peeples Spring would result in the removal of Tier 3 antidegradation protection for most of the stream that currently is protected as a unique water. ADEQ has never "declassified" a unique water and does not believe that a delisting action is consistent with the intent of the state's antidegradation rule. Moreover, ADEQ believes that the declassification of a unique water establishes a bad precedent for the unique waters program as a whole that could lead to additional requests to declassify and remove Tier 3 water quality protection from other established unique waters. As a general policy, unique waters should be maintained and protected for future generations. Once a unique water is established by rule, there should be no possibility of "delisting" it and removing its special status.
2. Restricting the unique waters classification to the area around South Peeples Spring would remove Tier 3 antidegradation protection from the Sycamore Spring area in the headwaters of Peeples Canyon Creek located in the Arrastra Mountain Wilderness Area. The practical result of this action would be to facilitate the use of the Sycamore Spring area of Peeples Canyon Creek as a livestock watering area. ADEQ believes that this would lead to significant degradation of existing water quality in the Sycamore Spring area. This result can and should be avoided by retaining the unique waters classification on the entire stream.
3. The Sycamore Spring area of Peeples Canyon Creek is perennial, has exceptional wilderness values, and meets the criteria for unique waters classification. While the Bureau of Land Management may be technically correct that

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the current listing of Peeples Canyon Creek is inconsistent with the original nomination documents submitted by BLM in 1985, the entire stream from its headwaters to its confluence with the Santa Maria River has been afforded Tier 3 antidegradation protection since 1992. ADEQ sees no compelling reasons to change the unique waters classification now and provide Tier 3 water quality protection in Peeples Canyon Creek on a limited and piecemeal basis.

Effluent-dependent waters [R18-11-113]

As noted in the preamble discussion of the definition of “effluent-dependent water,” ADEQ amended the definition of EDW to clarify that an EDW is a surface water that consists of wastewater discharges. Under the revised definition, an EDW is a surface water that, in the absence of the discharge of treated wastewater, is an ephemeral water. ADEQ also amended the information requirement in R18-11-113(C)(2) to conform it to the proposed amendment to the EDW definition as follows:

- C. Any person may submit a petition for rule adoption requesting that the Director classify a surface water as an effluent-dependent water. The petition for rule adoption shall include:
 - 1. A map and a description of the surface water.
 - 2. Information that demonstrates that the surface water consists ~~primarily~~ of discharges of treated wastewater.
 - 3. Information that demonstrates that the receiving surface water is an ephemeral water.

ADEQ considered several specific requests related to EDWs in this triennial review. First, the City of Willcox filed a petition for rule adoption requesting that Lake Cochise be classified as an effluent-dependent water. The City of Willcox has been treating municipal wastewater and reusing treated effluent on a local golf course. Excess treated effluent is stored in a playa depression that is known locally as Lake Cochise. The only source of water for Lake Cochise is treated wastewater. ADEQ added Lake Cochise as an effluent-dependent water and listed it in R18-11-113 and Appendix B.

Second, BHP Copper filed a petition for rule adoption requesting that a segment of Queen Creek from the Superior Mining Division discharge point downstream to the Town of Superior wastewater treatment plant be changed from an effluent-dependent water to an ephemeral water. BHP Copper provided information to ADEQ in support of its request demonstrating that the segment of Queen Creek that is the subject of this request is an ephemeral water. ADEQ amended R18-11-113(D)(3)(e) as follows:

- D. The following surface waters are classified as effluent-dependent waters:
 - 3. In the Middle Gila River Basin:
 - c. ~~Queen Creek from Superior Mining Division discharge~~ the Town of Superior WWTP outfall to its confluence with Potts Canyon

ADEQ also amended the listing of Queen Creek in Appendix B to indicate that it is an ephemeral water from its headwaters to the Town of Superior WWTP discharge outfall.

Third, the Pima County Wastewater Management Department requested that ADEQ classify two additional surface waters within the Santa Cruz River basin as EDWs. The two surface waters are currently identified as ephemeral waters. Proposed discharges of treated wastewater from the Green Valley Wastewater Treatment Facility to the Santa Cruz River and for the Kino Wetlands Project for a discharge to the Ajo Detention Basin in Julian Wash in the Tucson metropolitan area will create effluent-dependent waters. Pima County Wastewater Management Department submitted documentation demonstrating that the proposed EDW reaches will consist of discharges of treated wastewater and that the receiving waters are ephemeral waters. However, on the advice of the Governor’s Regulatory Review Council (GRRC), ADEQ decided not add the EDWs to R18-11-113. The GRRC staff pointed out that the proposed EDWs had not been included in the Notice of Proposed Rulemaking and that adding the new EDWs to the Notice of Final Rulemaking may constitute a substantial change to the rules that would violate A.R.S. § 41-1025. Consequently, ADEQ will defer action on this request to a future rulemaking.

Finally, ADEQ adopted a site-specific standard of 36 µg / L for the reach of the Rio de Flag from the Rio de Flag wastewater treatment plant discharge point to the confluence of Wildcat Canyon. The site-specific standard addresses high copper concentrations in the influent to the wastewater treatment plant due to naturally elevated copper concentrations in well water. A water effects ratio (WER) study was performed with effluent from the EDW portion of the Rio de Flag in Flagstaff, Arizona. The WER procedure is an EPA-approved procedure for developing site-specific standards for metals. The scientific basis for the WER procedure is as follows. EPA’s ambient water quality criteria for metals are derived from the results of acute and chronic laboratory toxicity tests done in clean laboratory water. Laboratory water contains very low concentrations of substances, such as dissolved organic carbon and suspended solids, or other substances that may sorb or form complexes with metals and reduce their bioavailability or toxicity. Also, EPA’s water quality criteria for metals are based on measurements of total recoverable metal, which EPA acknowledges may overestimate the toxicity of metals to aquatic life. The WER procedure was developed to modify criteria for metals to adjust for site-specific effects on metal toxicity in ambient surface waters.

In the WER procedure, two sets of acute or chronic toxicity tests with a metal are done side-by-side. One is done in laboratory water and the other is performed using water taken from the surface water being evaluated. Toxicity endpoints from the two sets of toxicity tests and the ratio between toxicity endpoints are calculated. This is the water

effects ratio. To develop a site-specific standard for the surface water, the national or state water quality criterion for the metal is multiplied by the water effects ratio. Two studies for the Rio de Flag were done to develop a site-specific standard for copper. A screening level study was done in June, 1996 and a definitive study done in August, 1996. These WER studies were done by ENSR Toxicology of Fort Collins, Colorado.

The results from the WER studies indicate that copper in the Rio de Flag is at least 6.9 times less toxic than in laboratory water used to derive EPA's ambient water quality criterion for copper. Based on these results, the current chronic water quality standard for copper could be increased 6.9 times without compromising the protection of sensitive aquatic species in the Rio de Flag. Although the results of the WER studies support such an increase, the City of Flagstaff requested that the copper standard be increased only by a factor of two. The proposed site-specific standard of 36 µg/L for copper in the Rio de Flag incorporates this additional margin of safety.

ADEQ adopted the following site-specific standard for dissolved copper in the Rio de Flag:

- F. The site-specific standard of 36 µg / L for dissolved copper for the aquatic and wildlife (effluent-dependent water) designated use applies to the Rio de Flag from the City of Flagstaff WWTP outfall to its confluence with the San Francisco Wash.

Revision of the mixing zone rule [R18-11-114]

States may, at their discretion, adopt policies in their rules that affect the application and implementation of water quality standards, such as a mixing zone policy. State mixing zone policies are subject to EPA review and approval [See 40 CFR § 131.13]. EPA recommends that states have a definitive statement in their water quality standards regulations on whether or not mixing zones are allowed. Arizona has a definitive statement in R18-11-114, the rule that authorizes mixing zones.

A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and where numeric water quality criteria may be exceeded in a receiving surface water. Mixing zones are based on the understanding that it is not always necessary to meet all water quality criteria at the point of discharge to protect the biological, chemical, and physical integrity of a surface water as a whole. Sometimes it is appropriate to allow a pollutant to be discharged in a concentration that exceeds the applicable water quality standard in the immediate area of an outfall. These areas are called mixing zones.

Mixing zones may be allowed provided: 1) the mixing zone does not impair the integrity of the surface water as a whole, 2) there is no lethality to organisms passing through a mixing zone, and 3) there are no significant human health risks, considering the likely exposure pathways. Fundamental to the theory of using mixing zones is the belief that by mixing with the receiving water within the zone, the discharge will become sufficiently diluted to meet applicable water quality criteria beyond the borders of the mixing zone.

Mixing zone characteristics are defined on a case-by-case basis after it is determined that there is assimilative capacity in a receiving surface water to safely accommodate the discharge of a pollutant. A mixing zone analysis should take into consideration the physical, chemical, and biological characteristics of the receiving surface water and the discharge, the potential impacts on the aquatic ecosystem, the protection of human health, and the designated uses of the receiving water.

EPA provides extensive guidance on mixing zones in the *Water Quality Standards Handbook, 2nd Edition* and the *Technical Support Document for Water Quality-Based Toxics Control* (USEPA, 1991, Sections 2.2, 4.3, and 4.4). These EPA guidance documents discuss mixing zone methodologies; the location, size and shape of mixing zones; in-zone water quality; the prevention of lethality to organisms passing through a mixing zone; mixing zone analyses; outfall designs that maximize initial dilution in a mixing zone; critical design periods for mixing zone analyses; and methods to analyze and model near-field and far-field mixing. ADEQ amended R18-11-114 to be more consistent with current EPA guidance on mixing zones and to clarify the administrative procedures that apply to the establishment of a mixing zone.

R18-11-114 should specifically prescribe water quality requirements within mixing zones. Because a mixing zone is an allocated impact zone where dilution of a discharge is in progress, ADEQ understands that acute and chronic water quality criteria may be exceeded within different boundaries in a mixing zone. ADEQ wants to clarify statements in the current rule at R18-11-114(F), which states that "the Director shall deny the request to establish a mixing zone...if concentrations of pollutants within the proposed mixing zone will cause acute toxicity to aquatic life." This statement incorrectly suggests that acute toxicity criteria to protect aquatic life always must be met at the "end-of-the-pipe" and that ADEQ cannot establish a mixing zone for an acute toxicity criterion. ADEQ amended the statement in R18-11-114(F) in order to allow ADEQ to establish a zone of initial dilution (ZID) in a mixing zone where it is permissible to exceed an acute toxicity criterion provided certain conditions are met. In a ZID immediately surrounding an outfall, neither acute or chronic toxicity criteria are met. The acute criterion must be met at the boundary of the ZID. In the outer mixing zone, the acute criterion, but not the chronic criterion must be met. The chronic criterion must be met at the boundary of the outer mixing zone. This amendment is consistent with current EPA guidance on mixing zones [See *Water Quality Standards Handbook, Second Edition*, Figure 5-1, p. 5-4, and *Technical Support Document for Water Quality-based Toxics Control*, Section 2.2.2, p. 33]. Current EPA guidance does not completely prohibit mixing zones for acute toxicity criteria. Rather, EPA guidance prohibits concentrations of pollutants in a mixing zone that

are acutely lethal to aquatic organisms passing through a mixing zone. The zone of initial dilution in the mixing zone is sized to prevent lethality to passing organisms.

Lethality is a function of the magnitude of pollutant concentrations and the duration an organism is exposed to those concentrations. An acute toxicity criterion describes the condition under which lethality will not occur if the duration of exposure at the acute toxicity concentration is less than one hour. Thus, the areal extent and concentration isopleths of a mixing zone must be such that the one-hour average exposure of organisms passing through the mixing zone is less than the acute toxicity criterion. An organism must be able to pass through a zone of initial dilution or escape the high concentration area. Lethality to passing organisms can be prevented in a mixing zone in several ways. First, ADEQ can continue the approach articulated in the current rule which prohibits ZIDs, and require that acute toxicity criteria be met at the "end-of-the-pipe." This conservative approach ensures the prevention of acute toxicity in a receiving water. The second approach is to require that an acute toxicity criterion be met at the boundary of an appropriately-sized ZID that is designed to prevent lethality to passing organisms. In the second approach, an acute toxicity criterion may be exceeded within a ZID. Hydraulic investigations and calculations would have to be provided to ADEQ to demonstrate that the acute toxicity criterion will be met at the boundary of the ZID during critical design flow conditions. *The Water Quality Standards Handbook, Second Edition*, Section 5.1.2, provides specific guidance on methods that can be used to prevent lethality.

Mixing zones should be denied for persistent, bioaccumulative pollutants of concern (BCCs). The potential for a pollutant to bioaccumulate in living organisms is a function of the bioaccumulation factor (BAF) or bioconcentration factor (BCF) for the pollutant, the duration of exposure, and the concentration of the pollutant. While any BCF greater than one indicates that bioaccumulation potential exists, bioaccumulation potential is generally not considered to be of concern unless the BAF or BCF exceeds 1000 or more. The proposed mixing zone prohibition is limited to the following persistent BCCs: chlordane, DDT and its metabolites (DDE and DDT), dieldrin, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, lindane, mercury, PCBs, dioxin, and toxaphene.

Mixing zones for persistent BCCs should be prohibited to the greatest extent technically and economically possible. This is because BCCs, due to their persistent and bioaccumulative nature, are incompatible with mixing zones. By definition, BCCs are chemicals that do not degrade over time. These chemicals accumulate in organisms living in surface waters and they become more concentrated as they move up the food chain - from biota to fish and wildlife to humans. Because the effects of these chemicals are not mitigated by dilution, using a mixing zone to dilute the discharge of a BCC is inappropriate. Dilution and dispersion are not appropriate control strategies for BCCs and a mixing zone is an inadequate substitute to the removal and treatment of a BCC at the source before it is discharged to a surface water.

Finally, ADEQ made some procedural changes to R18-11-114 relating to how mixing zones are established. R18-11-114(A) states that the Director may establish a mixing zone by order. ADEQ amended R18-11-114(A) to clarify that a mixing zone is established as part of the NPDES permit issuance process and not by administrative order.

Nutrient Waivers [R18-11-115]

R18-11-115 authorizes a waiver from water quality standards for total phosphorus and total nitrogen that apply to ephemeral waters by operation of the tributary rule. Nutrient waivers are available on a discharger-specific basis. Typically, they are issued to the operators of wastewater treatment plants that discharge to ephemeral tributaries to surface waters to which numeric nutrient standards apply. Under R18-11-115, a discharger must apply for a nutrient waiver. A discharger may obtain a nutrient waiver by demonstrating that the discharge of wastewater to an ephemeral tributary will not cause a violation of the nutrient standards that apply to the downstream surface water.

Currently, both the nutrient waiver rule at R18-11-115 and the variance rule at R18-11-122 provide mechanisms for a point source discharger to discharge wastewater containing concentrations of nitrogen or phosphorus that exceed surface water quality standards. In effect, a nutrient waiver is a type of variance from water quality standards. While different information requirements and conditions apply to nutrient waivers and variances, they are similar in many respects. Nutrient waivers and variances have the following similarities:

- Both authorize a temporary exceedance of a water quality standard.
- Both are discharger-specific.
- Both are pollutant-specific (for example, total nitrogen or total phosphorus)
- Both have five-year terms.
- Both are re-evaluated upon the issuance, reissuance, or modification of the NPDES permit for the discharge.
- The same public participation processes apply to variances and nutrient waivers.
- The same administrative appeal processes apply to both.
- Variances and nutrient waivers are both subject to EPA review and approval.

There are three major differences between a variance and a nutrient waiver. First, the grounds for obtaining a variance are different from the grounds for obtaining a nutrient waiver. To obtain a variance, a discharger must demonstrate that treatment more advanced than applicable technology-based requirements of the Clean Water Act are necessary to

comply with a water quality standard and either: 1) it is not technically feasible to achieve compliance within five years, or 2) the cost of treatment to achieve compliance would result in “substantial and widespread economic and social impact.” For example, a wastewater treatment plant operator who wants to obtain a variance from a nutrient standard would have to demonstrate: 1) that treatment beyond secondary treatment requirements is necessary to achieve compliance with the nutrient standard, and 2) that it is either not technically feasible to install nutrient control treatment technology at the wastewater treatment plant within five years or the cost of installing the treatment technology would have a substantial and widespread economic and social impact in the community. These technology requirements do not apply to nutrient waivers. To obtain a nutrient waiver, the operator of the wastewater treatment plant must demonstrate that the receiving water is an ephemeral water and that the discharge of wastewater to the ephemeral water will not cause a violation of applicable nutrient standards in the nearest downstream surface water. There are no requirements to demonstrate that it is technically or economically infeasible to install nutrient control technology at the wastewater treatment plant to obtain a nutrient waiver.

Second, to renew a variance a discharger must demonstrate that a discharging facility is making “reasonable progress” towards achieving compliance with the applicable standard over the term of the variance [See R18-11-122(D)]. In effect, R18-11-122(D) is a technology-forcing provision that requires a periodic review to see if it is feasible to achieve compliance with water quality standards. In the example provided in the previous paragraph, R18-11-122(D) would require that the wastewater treatment plant operator control the discharge of nutrients to the maximum extent practicable with existing treatment technology. The rule would require a wastewater treatment plant operator to install a treatment upgrade to control the excessive concentration of nutrients in a discharge. The “reasonable progress” requirement is not found in the current nutrient waiver provision. There is nothing in the current nutrient waiver rule that requires a discharger to take any steps at all to control the discharge of nutrients once a nutrient waiver is obtained. Wastewater treatment plant operators who have obtained nutrient waivers for their facilities typically reapply and renew them every five years. There is nothing in the rule that requires a review to determine whether it is feasible to install nutrient control technologies. Consequently, the rule permits wastewater treatment plants to continue operation over consecutive five-year nutrient waiver cycles without ever having to address the excessive discharge of nutrients to the receiving water.

Finally, the current variance provision requires the proposal of interim discharge limitations that represent the highest level of treatment that is achievable by a point source discharge during the term of the variance. A nutrient waiver does not require the proposal of interim discharge limitations to control the discharge of nutrients. Instead, the nutrient waiver provision waives the applicable surface water quality standards for total nitrogen or total phosphorus. In doing so, a nutrient waiver removes the legal basis for the establishment of any water quality-based discharge limitations in an NPDES permit to control the discharge of nutrients to the receiving water. There are no regulatory requirements to improve the performance of the wastewater treatment plant.

ADEQ repealed the nutrient waiver provision at R18-11-115 for two reasons. First, the variance provision serves the same function as the nutrient waiver provision. A variance can be obtained from water quality standards for total phosphorus or total nitrogen. Second, ADEQ believes that the surface water quality standards rules should require a discharger to take steps to upgrade treatment to control the discharge of nutrients if it is technically and economically feasible to do so. At a minimum, the rule should require the implementation of measures to control the discharge of nutrients to the maximum extent practicable (that is, through imposition of interim discharge limitations). Unlike the variance rule, the nutrient waiver rule has no requirements to take corrective action to control the discharge of nutrients even if treatment upgrades are technically and economically feasible. The nutrient waiver rule authorizes the continued discharge of wastewater that exceeds applicable nutrient standards without any consideration of available treatment alternatives to control nutrients in that discharge. There are no incentives in the nutrient waiver rule for achieving compliance with water quality standards.

The repeal of the nutrient waiver provision is opposed by some members of the regulated community who are concerned that the current variance provision is so restricted that it is effectively unavailable to dischargers. The regulated community has argued that the current nutrient waiver provision should be retained because it is limited in its scope. They argue that the nutrient waiver rule is limited in scope because: 1) it applies only to two pollutants, nitrogen and phosphorus, neither of which are toxic pollutants, and 2) it applies only to discharges to ephemeral waters that are tributary to surface waters for which nutrient standards have been established. Finally, it is argued that the nutrient waiver provision should be retained because it provides a significant benefit to small wastewater treatment plants that may not have the financial capability to upgrade treatment processes.

ADEQ disagrees that variances are effectively unavailable to dischargers. A variance for nutrients can be obtained on grounds that it is not economically feasible to install nutrient control technologies at a wastewater treatment plant. Second, ADEQ disagrees that wastewater treatment plants should not be required to control nutrients in discharges to ephemeral tributaries of surface waters for which nutrient standards have been established. The discharge of treated wastewater to an ephemeral water creates an effluent-dependent water. The effective control of nutrients in the treated wastewater that creates the EDW will improve water quality in EDWs and help prevent accelerated eutrophication and the nuisance growth of algae. Finally, less than 10 wastewater treatment plants in the state currently operate under nutrient waivers. Small wastewater treatment plants operators who are financially incapable of upgrading treatment processes to control the discharge of nutrients should be able to obtain a variance on economic grounds.

Dams and flood control structures [R18-11-118]

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ADEQ repealed the current R18-11-118(B). R18-11-118(B) states that nothing in the surface water quality standards rules shall be construed to require a person who operates a dam or flood control structure to operate the structure to cure or mitigate an exceedance of a water quality standard caused by another person. The provision is confusing. The original intent of R18-11-118(B) is not clear, especially since R18-11-118(C) already states that nothing in the surface water quality standards rules shall require the release of water from a dam. It is not clear how a person could operate a dam or flood control structure to cure or mitigate an exceedance of a water quality standard caused by another person except by releasing of water. R18-11-118(B) is unnecessary.

Enforcement [R18-11-120]

ADEQ amended R18-11-120(C). R18-11-120 (C) states that ADEQ shall determine compliance with chronic aquatic and wildlife (A&W) criteria from the arithmetic mean of the analytical results of samples collected over a period of four consecutive days at a minimum rate of one grab sample per day. The current rule makes the state's chronic A&W criteria practically unenforceable.

ADEQ staff in the Surface Water Quality Monitoring and Standards Unit are responsible for conducting ongoing monitoring of the surface waters in the state. Each year, ADEQ staff conduct water quality monitoring at Fixed Station Network sites statewide to determine long-term water quality trends and compliance with surface water quality standards. Also, ADEQ staff have implemented a targeted watershed approach to surface water quality monitoring and assessment. Arizona is divided into ten watersheds for monitoring purposes. ADEQ staff conduct monitoring at sites located in two watersheds each year. A five-year rotating schedule has been established so all ten watersheds will be monitored over a five-year period. ADEQ staff conduct monitoring at each sampling site four times a year. Because of budget, time, and other resource constraints, ADEQ staff cannot stay at a single sampling site for four consecutive days to take water quality samples at the rate of one grab sample per day. Consequently, ADEQ does not meet the minimum data requirements to determine compliance with chronic A&W water quality standards.

ADEQ amended R18-11-120(C) to make it possible to assess compliance with chronic A&W water quality standards. ADEQ amended the rule as follows:

- C. The Department shall determine compliance with acute aquatic and wildlife criteria from the analytical result of a grab sample. Compliance with chronic aquatic and wildlife criteria shall be determined from the ~~arithmetic~~ geometric mean of the analytical results of ~~grab samples collected over a period of 4 consecutive days at a minimum rate of 1 grab sample per day~~ the last four samples taken at least 24 hours apart.

Schedules of compliance [R18-11-121]

ADEQ amended R18-11-121 to allow compliance schedules for new and recommencing point sources, similar to EPA's schedule of compliance provision for NPDES permits at 40 CFR § 122.47.

R18-11-121(B) states that a schedule of compliance shall not be established in a NPDES permit for a new point source. The rule defines a new point source as follows:

[A] new point source means a point source, the construction of which commences after the effective date of a water quality standard. Commencement of construction means that the owner or operator of the point source has obtained the federal, state, and local approvals or permits necessary to begin physical construction of the point source and either:

1. Onsite physical construction program has begun; or
2. The owner or operator has entered into a contract for physical construction of the point source and the contract cannot be cancelled or modified without substantial loss. For purposes of this subsection, "substantial loss" means in excess of 10% of the total cost incurred for physical construction.

The federal NPDES permit rules include a schedule of compliance provision for new sources at 40 CFR § 122.47(a)(2). The federal NPDES permit regulations do not prohibit schedules of compliance for new sources or new dischargers. The federal rule permits a schedule of compliance for a new source, but only when necessary to allow a reasonable opportunity to attain compliance with requirements that are issued or revised after commencement of construction but less than three years before commencement of the relevant discharge. The federal rule also permits schedules of compliance for recommencing dischargers to allow a reasonable opportunity to attain compliance with requirements issued or revised less than three years before recommencement of a discharge. ADEQ amended R18-11-121(B) to make it consistent with the federal regulation that addresses schedules of compliance for new and recommencing dischargers.

Variances [R18-11-122]

In the last triennial review, ADEQ adopted R18-11-122, which establishes a procedure for granting a variance from a water quality standard. The adoption of R18-11-122 is consistent with EPA guidance, which states that variances from state-adopted water quality standards are allowed [*See Water Quality Standards Handbook, 2nd Edition*, § 5.3 (August, 1994)].

According to EPA guidance, a variance from water quality standards involves the same substantive and procedural requirements that apply to the removal of a designated use through the use attainability process, except that variances are discharger-specific, pollutant-specific, limited in duration, and do not result in a change to a designated use. A

variance is viewed as an alternative to a permanent downgrade of a water quality standard. A variance is typically used where a state believes that a water quality standard can ultimately be attained. By maintaining the water quality standard as a goal for the surface water and granting a variance, the state can assure that reasonable progress is made towards improving water quality. With a variance, a NPDES permit may be written to ensure that reasonable progress is made toward attaining the water quality standard without violating § 402(a)(1) of the Clean Water Act [33 U.S.C. § 1342(a)(1)] which requires that NPDES permits ensure compliance with water quality standards.

R18-11-122 authorizes a variance where a point source discharger demonstrates that it is not technologically feasible to immediately comply with an applicable water quality standard or where compliance with a water quality standard will cause substantial and widespread economic and social impact. The variance procedure allows temporary non-compliance with a water quality standard while maintaining that standard as a water quality goal for a surface water.

In the 1992 triennial review, Arizona adopted a comprehensive set of numeric water quality standards for toxic pollutants. The numeric water quality criteria were derived using methodologies that did not take the economic or technical feasibility of achieving compliance into consideration. The water quality criteria were established at concentrations deemed necessary to protect the various designated uses. In the last triennial review, ADEQ acknowledged that a variance procedure should be included in the water quality standards rules to provide regulatory flexibility when it is not technically or economically feasible for a point source discharger to achieve compliance with a water quality standard. Situations can and do arise where a point source discharger cannot comply with a water quality standard because the treatment technology is unavailable or the cost of treatment is too high. In such cases, a variance procedure provides a mechanism for maintaining the water quality standard as the ultimate water quality goal for a surface water while providing short-term relief from the water quality standard for a specific discharge. The grant of a variance does not modify a water quality standard, but it does provide the legal basis for the establishment of alternative discharge limitations in a NPDES permit. The allowance of a variance on a discharger-specific, pollutant-specific, short-term basis is preferable to a permanent downgrade of the water quality standards for a surface water through the use attainability process.

Under R18-11-122, a variance may be granted on a discharger-specific basis for a period of up to five years. A variance is implemented through a NPDES permit for a specific point source discharge. A point source discharger must document that treatment more advanced than that required by technology-based effluent limitations prescribed by the Clean Water Act is necessary to achieve compliance with the water quality standard and that alternative discharge control strategies to achieve compliance with the water quality standard have been evaluated. The point source discharger must document that it is not technically feasible to install and operate any of the available discharge control technologies to achieve compliance with the water quality standard or that the installation and operation of the treatment technology would cause substantial and widespread social and economic impact. An applicant for a variance also must demonstrate that the discharge of the pollutant for which a variance is sought is reduced to the maximum extent practicable through implementation of a local pretreatment program, source reduction, or waste minimization. Finally, an applicant for a variance must propose interim discharge limitations that represent the highest level of treatment achievable by the point source discharge during the term of the variance.

A variance may be renewed, but a point source discharger who seeks renewal must demonstrate that reasonable progress towards achieving compliance with the water quality has been made during the term of the variance.

R18-11-122 includes public participation procedures and provides a right of appeal to any person who may be adversely affected by a decision to grant or deny a variance from a water quality standard. The rule also clarifies that all variances are subject to EPA review and approval.

ADEQ received a request that ADEQ reconsider a number of issues related to variances that were raised in the last triennial review. These issues include: 1) the suggestion to modify the variance procedure to permit temporary suspensions of a water quality standard while one or more dischargers work under ADEQ supervision to correct a water quality problem, 2) a request to amend the variance procedure to include all six use attainability factors identified by EPA in 40 CFR § 131.10(g), 3) a request to extend the variance provision to cover nonpoint source discharges, and 4) a request to allow variances for specific surface waters or segments of surface waters. ADEQ specifically responded to several of these issues in the last triennial review and those comment responses reflect ADEQ current thinking on these issues.

ADEQ disagrees that R18-11-122 should be amended to authorize variances for nonpoint source discharges. While EPA has approved variance procedures for nonpoint source discharges in a few states like Colorado, such states are in the minority. In the National Assessment of State Variance Procedures published in November, 1990, EPA reported that 32 of the 57 states and territories have authority to grant variances from water quality standards. Of these states, 22 allowed variances from water quality standards for individual dischargers and only seven states specifically authorized variances for nonpoint source runoff.

A significant concern with authorizing variances from water quality standards for nonpoint sources is that the grant of a variance may undermine the implementation of best management practices [BMPs] through nonpoint source management control programs. A nonpoint source discharger may seek a variance rather than identifying and implementing BMPs that could be used to achieve compliance with water quality standards.

ADEQ also is concerned about how to administer and implement a variance for a nonpoint source discharge. A variance from a water quality standard may be issued only on a discharger-specific basis under the current rule. The grant

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of a variance does not modify a water quality standard in a surface water. Other point source discharges to the surface water are required to comply with the applicable water quality standards, including the water quality standard for which a variance has been granted to a specific discharger. A variance for a nonpoint source discharge would be fundamentally different. It would not be possible to grant a variance for a nonpoint source discharge on a discharger-specific basis. The only way to grant a variance for a nonpoint source discharge would be to temporarily modify the water quality standard for the surface water. A temporary modification of a water quality standard would affect all point source and nonpoint source discharges to the surface water. Moreover, under Arizona law, rulemaking would be required to modify a water quality standard in this way.

As adopted by ADEQ, a variance is clearly tied to the NPDES permitting program. Variances are for terms of up to five years and they are re-evaluated when a NPDES permit for a point source discharge is reissued. There is no similar regulatory program through which a variance for a nonpoint source discharge could be administered.

Finally, the intent of the variance provision is to ensure the highest level of water quality achievable while a variance is in effect. The final rule achieves this by requiring a demonstration by a point source discharger that the discharger has reduced, to the maximum extent practicable, the discharge of the pollutant for which a variance is sought. The discharger also is required to propose interim discharge limitations that represent the highest level of treatment achievable during the term of the variance. It is not clear how to ensure the highest level of water quality achievable when a variance is requested for a nonpoint source discharge.

ADEQ also disagrees that variances should be permitted for all of the grounds that support a use attainability analysis. While EPA guidance on variances indicates that a variance from a water quality standard may be based upon any of the six grounds for removing a designated use prescribed in 40 CFR § 131.10(g), ADEQ does not believe that four of the grounds cited in 40 CFR § 131.10(g) are appropriate for a discharger-specific variance. These grounds are:

1. Naturally occurring pollutant concentrations prevent the attainment of the water quality standard;
2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the water quality standard, unless these conditions may be compensated by the discharge of a sufficient volume of effluent to enable the water quality standard to be met without violating state water conservation requirements;
3. Dams, diversions or other types of hydrologic modifications preclude the attainment of the water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the water quality standard; and
4. Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles and the like, unrelated to chemical water quality, preclude the attainment of the water quality standard.

While the four grounds cited above may support the removal or downgrade of a designated use of a surface water, they do not support a temporary variance for a specific point source discharger. For example, it is not clear how “[n]aturally-occurring pollutant concentrations that prevent attainment of the water quality standard” may be applied to support a variance for an individual point source discharge. While there may be situations where it is not possible to comply with a water quality standard because of naturally-occurring pollutant concentrations in a surface water, it is difficult to see why a specific point source discharge should be granted a variance from a water quality standard on this ground. If it is impossible to attain compliance with a water quality standard because of naturally-occurring pollutant concentrations, then the appropriate remedy is to conduct a use attainability analysis to modify the water quality standard for the surface water. A variance is premised on the belief that the conditions which prevent attainment of a water quality standard are temporary in nature and that compliance with the water quality standard ultimately can be achieved. When a naturally-occurring concentration of a pollutant prevents the attainment of a water quality standard, it is unlikely that compliance with the water quality standard will ever be achieved. Naturally-occurring pollutant concentrations in a surface water are permanent in nature. Similarly, when natural, ephemeral, intermittent or low-flow conditions prevent attainment; or dams, diversions, or other types of hydrologic modifications prevent attainment; or physical conditions related to the natural features of a surface water prevent attainment of a water quality standard, then the appropriate regulatory response is a use attainability analysis [UAA], not a variance. When such conditions exist, they are permanent in nature and it is unlikely that such conditions will change in the future.

When ADEQ adopted the variance provision in 1996, ADEQ stated its position that only one element in 40 CFR § 131.10(g) may be applied on a discharger-specific basis because it was related to a discharger’s capability to install and operate discharge control technology to attain designated uses. 40 CFR § 131.10(g)(6) allows the removal of a designated use if it can be demonstrated that attaining the designated use is not feasible because “controls more stringent than those required by § 301(b) and § 306 of the Act would result in substantial and widespread economic and social impact.”

When EPA first indicated the allowability of state water quality variance provisions in the federal water quality standards regulations at 40 CFR § 131.13, EPA stated in the preamble that state-adopted variances could be approved if they were based upon a demonstration that meeting a water quality standard would cause “substantial and widespread economic and social impact” [See 48 Federal Register 51403]. This conclusion was based upon Decision of the General Counsel No. 58 [44 Federal Register 39508 (March 29, 1977)]. In that decision, EPA stated:

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[V]ariations can be granted by States only when achieving the standard is unattainable. In demonstrating that meeting the standard is unattainable, the State must demonstrate that treatment in excess of that required by § 301(b)(2)(A) and (B) of the CWA is necessary to meet the standard and also must demonstrate that requiring such treatment will result in substantial and widespread economic and social impact....

Subsequent EPA guidance elaborated federal variance policy. On March 15, 1985, EPA issued a memorandum reinterpreting the factors that could be considered when granting variances. The memorandum explained that variances could be based on any of the grounds outlined in 40 CFR § 131.10(g) for removing a designated use. This interpretation was based on EPA's reading of § 410 of the Clean Water Act [33 U.S.C. 1370] which says that states have the right to establish more stringent standards than those suggested by EPA. EPA concluded that as long as any temporary water quality standards variance conformed to the requirements established in 40 CFR § 131.10(g) for removal of a designated use, it would be more stringent than the federal requirements because it would be a temporary rather than a permanent downgrade in use.

EPA has stated in guidance that although the March 15, 1985 memorandum broadened the factors that could be considered for granting a variance, *it continued to interpret variances as being limited to individual dischargers*. EPA has acknowledged that while the legal rationale for broadening the factors may seem reasonable, the practical impact of limiting variances to individual dischargers is that the only factor that actually can be used is the "substantial and widespread economic and social impact" factor.

The variance provision at R18-11-122 is intended to apply on a discharger-specific basis. ADEQ recognizes that situations can and do arise where technological limitations or substantial economic hardship for a specific discharger make short-term compliance with standards impossible. In such cases, a variance from the water quality standard may be justified. In ADEQ's view in 1996, the only ground that could be practically applied to support a request for a variance in such situations was the "widespread and substantial economic and social impact" factor.

In comments on the preliminary draft rules and the proposed surface water quality standards rules, the Arizona Mining Association renewed a request to expand the grounds for variances and to allow variances for specific surface waters or segments of surface waters. ADEQ continues to disagree that variances should be allowed for specific surface waters. Variances should be allowed on a discharger-specific basis only. This is consistent with current EPA policy that variances are discharger and pollutant-specific and limited in duration. A "waterbody variance" is essentially a modification of a water quality standard that can be done in Arizona only through the rulemaking process.

The suggestion by the Arizona Mining Association to allow for a "waterbody variance" is consistent with an approach to variances that EPA solicited comment on in the Advanced Notice of Proposed Rulemaking (ANPR) on the federal water quality standards regulation. EPA stated in the ANPR that it was considering the approach of dividing variances into two categories: waterbody variances [to which the first five designated use removal elements in 40 CFR § 131.10(g) would apply] and discharger-specific variances [to which the "substantial and widespread economic and social impact" factor would apply]. While ADEQ recognition of a "waterbody variance" would be consistent with EPA's approach, ADEQ does not believe that the grounds that support a "waterbody variance" are distinguishable from the factors that support the downgrade or removal of a designated use through the use attainability process. For example, if naturally-occurring pollutant concentrations in a surface water prevent the attainment of a designated use, then the appropriate regulatory response is the removal of the designated use, not the issuance of a variance that is limited in duration. In general, variances should be used only where the state believes that a water quality standard can ultimately be attained. ADEQ believes that four of the five grounds in 40 CFR § 131.10(g) [other than "widespread and substantial economic and social impact" and "human-caused sources of pollution"] that are cited by EPA as supporting a "waterbody variance" are essentially permanent in character. It is unlikely that where such conditions exist in a surface water, that the conditions will change so that the water quality standard ultimately may be attained. Where a water quality standard cannot be attained because of naturally occurring pollutant concentrations; low flow conditions; the existence of dams, diversions, or other hydrological modifications; or physical conditions related to the natural features of a surface water, it is unlikely that the water quality standard will ever be attained, even in the long term. Where such conditions exist, a UAA should be conducted to remove or permanently downgrade the designated use. Finally, it should be noted that while EPA stated that it was considering water body variances in the ANPR, EPA has not proposed this type of variance in any revisions to the federal water quality regulations.

ADEQ reconsidered one of the grounds for a UAA that ADEQ believes may be used to support a variance. One of the grounds for a UAA is "...human-caused conditions or sources of pollution prevent the attainment of the water quality standard and cannot be remedied, or would cause more environmental damage to correct than leave in place." There may be situations where human-caused conditions or sources of pollution prevent the attainment of a water quality standard and they cannot be remedied in the short-term (that is, within five years), but the water quality standard may be ultimately attainable. For example, a TMDL strategy may be implemented that is designed to achieve compliance with a water quality standard or implementation of a remediation program may result in attainment. However, the time line for achieving compliance with the water quality standard may be longer than five years. Under such circumstances, it may be appropriate to grant a variance to a point source discharger.

Prohibitions against discharge [R18-11-123]

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ADEQ prohibited the discharge of sewage from vessels to Lake Powell in R18-11-123. This prohibition is based upon § 312(f)(1)(B)(3) of the Clean Water Act [33 U.S.C. § 1322(f)(1)(B)(3)] which addresses the regulation of marine sanitation devices. It states, in relevant part:

[I]f any State determines that the protection and enhancement of the quality of some or all of the waters within such State require greater environmental protection, such State may completely prohibit the discharge from all vessels of any sewage, whether treated or not, into such waters, except that no such prohibition shall apply until the Administrator determines that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such water to which such prohibition would apply.

The States of Utah and Arizona applied to EPA to prohibit the discharge of sewage to Lake Powell. ADEQ determined that the protection and enhancement of Lake Powell water quality requires greater environmental protection by prohibiting discharges of sewage from vessels. Moreover, ADEQ believes that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available at Lake Powell. Consequently, ADEQ added the prohibition against the discharge of sewage from vessels to Lake Powell in R18-11-123.

Appendix A. Numeric Water Quality Criteria

A water quality standard is defined as a provision of state law that consists of designated uses *and water quality criteria based upon such uses* [See § 303(c)(2)(A) of the Clean Water Act]. Water quality criteria are specifically defined by federal regulation as “elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When the criteria are met, water quality will generally protect the designated use” [See 40 CFR § 131.3].

40 CFR § 131.11(a)(1) requires that states adopt water quality criteria to maintain and protect water quality for designated uses. State-adopted water quality criteria must be based on a sound scientific rationale and they must contain sufficient parameters or constituents to protect the designated uses. In establishing numeric water quality criteria for designated uses, states may establish numeric values based upon the following: 1) EPA recommendations contained in national criteria guidance documents published under § 304(a) of the Clean Water Act, 2) § 304(a) guidance modified to reflect site-specific conditions, or 3) other scientifically defensible methods.

§ 304(a) of the Clean Water Act requires EPA to develop and publish, and from time to time revise, criteria for water quality accurately reflecting the latest scientific knowledge. Water quality criteria developed under § 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. EPA’s § 304(a) criteria do not reflect consideration of economic impacts or technological feasibility of meeting the chemical concentrations in ambient water. EPA’s § 304(a) criteria recommendations provide guidance to the states in adopting numeric water quality standards. While EPA’s national criteria recommendations are not regulations and they do not impose legally binding requirements on states, once EPA publishes new or revised § 304(a) criteria guidance, EPA expects states to adopt new or revised criteria into their water quality standards. On December 10, 1998, EPA published a compilation of recommended water quality criteria in the Federal Register [See 63 Federal Register 68354 (December 10, 1998)]. ADEQ reviewed the EPA’s national criteria recommendations and determined that the state-adopted criteria are consistent.

Arizona law also provides guidelines for the state adoption of numeric water quality criteria for designated uses. A.R.S. § 49-221(C)(5) states that ADEQ shall consider the guidelines, action levels or numerical criteria adopted or recommended by EPA or any other federal agency when setting water quality standards. As noted earlier, there is a preference in Arizona law for numeric water quality criteria if adequate information exists to support the establishment of numeric standards [See A.R.S. § 49-221(D)]. Finally, A.R.S. § 49-222(C) sets forth legislative guidelines for setting numeric standards for surface waters:

In setting numeric standards for the quality of navigable waters, the director may consider the effect of local water quality characteristics on the toxicity of specific pollutants and the varying sensitivities of local affected aquatic populations to such pollutants, and the extent to which the natural flow of the stream is intermittent or ephemeral, as a result of which the instream flow consists mostly of treated wastewater effluent, except that such standards shall not, in any event, be inconsistent with the Clean Water Act.

ADEQ amended the water quality criteria for many pollutants and designated uses in this triennial review. For some designated uses, ADEQ revised the methodology that was used to derive the numeric criteria. For example, ADEQ revised the methodology that is used to derive water quality criteria for the partial-body contact recreation designated use. For other designated uses, ADEQ used the same criteria derivation methodologies but updated the criteria using human health effects and toxicity data that has become available since the last triennial review of water quality standards.

Revising the numeric water quality criteria in Appendix A for the protection of human health

Appendix A contains numeric water quality criteria for four designated uses that are intended to protect human health. The four designated uses are: domestic water supply (DWS), fish consumption (FC), full-body contact recreation (FBC), and partial-body contact recreation (PBC). Water quality criteria for these designated uses are established at concentrations that are intended to protect against long-term, or chronic, human health effects.

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ADEQ uses EPA-recommended methodologies to derive water quality criteria for the DWS, FBC, and FC designated uses. Separate criteria derivation methodologies were used to calculate criteria for pollutants depending on whether a pollutant is a carcinogen or non-carcinogen. The carcinogen procedure was used to derive criteria for pollutants that EPA identifies as known, probable, or possible human carcinogens. The carcinogen procedure employs the use of cancer potency slopes ($q1^*$) in the calculation to derive a criterion. The non-carcinogen procedure uses reference doses (RfDs) to calculate a criterion.

Revising criteria for the domestic water source designated use

ADEQ derived criteria to maintain and protect water quality for surface waters that are used as a raw water source for drinking water (that is, the domestic water source or DWS designated use) in two ways. First, ADEQ uses maximum contaminant levels (MCLs) that have been promulgated for drinking water under the Safe Drinking Water Act as numeric criteria for the DWS designated use where MCLs are available. ADEQ revised the DWS criteria to include the following MCLs:

Dalapon	200 µg / L
Di (2-ethylhexyl) adipate	400 µg / L
Dinoseb	7 µg / L
Diquat	20 µg / L
Endothall	100 µg / L
Endrin	2 µg / L
Glyphosate	700 µg / L
Oxamyl	200 µg / L
Picloram	500 µg / L
Simazine	4 µg / L

Second, ADEQ established a criterion of 100 µg / L for total trihalomethanes, including bromodichloromethane, bromoform, chloroform, and dibromochloromethane. This criterion is the same as the MCL for total trihalomethanes. The MCL for total trihalomethanes also represents the maximum allowable limit for each individual trihalomethane. ADEQ proposed to include the numeric criteria for the individual trihalomethanes by adding 100 µg / L after “TTHM” for each individual trihalomethane listed in Appendix A, Table 1. However, this proposal was confusing because it suggested that the numeric criterion for total trihalomethanes may be 400 µg / L rather than 100 µg / L. To avoid confusion, ADEQ decided to retain the “TTHM” footnote for the individual trihalomethane parameters.

Third, ADEQ derived numeric criteria for the DWS designated use using the following methodologies when MCLs are not available:

$$\text{For carcinogens:} \quad \frac{70 \times 10^{-6}}{q1^* \times 2}$$

In this equation, 70 represents the average weight of a human male in kilograms (kg); 10^{-6} (1 in 1,000,000) is the excess cancer risk level, $q1^*$ is the cancer potency slope, and 2 is the national average water consumption rate in liters / day.

$$\text{For non-carcinogens:} \quad \frac{\text{Rfd} \times 70 \times 0.2}{2}$$

In this equation, Rfd is the oral reference dose in milligrams / kilogram / day; 70 is the average weight of a human male in kilograms (kg); 0.2 is the allowable water source contribution factor; and 2 is the national average water consumption rate in liters / day. The use of an allowable water source contribution factor is a way of recognizing that a person’s exposure to a pollutant may come from other sources, such as dietary intake, and from other exposure pathways such as inhalation and dermal contact. There is little information available to assess the amount of exposure to a chemical that may be attributed to various exposure pathways. EPA uses an allowable water source contribution factor of 0.2 in the Safe Drinking Water Act program to calculate MCLs. This means that EPA estimates that 20% of a person’s exposure to a pollutant is estimated to be through ingestion of drinking water. EPA considers this value to be reasonably conservative and protective when developing standards for drinking water. ADEQ used the same allowable water source contribution value of 20% to derive criteria for non-carcinogens for the DWS designated use when there is no MCL.

ADEQ updated the DWS criteria for parameters using current $q1^*$ s and RfDs from the Integrated Risk Information System database. ADEQ has new human health effects data to derive DWS criteria for the following pollutants that currently do not have numeric criteria:

Chlorine (total residual)	NNS to 700 µg / L
Chromium III	NNS to 10,500 µg / L
Chromium VI	NNS to 21 µg / L
2,6 - Dinitrotoluene	NNS to 0.05 µg / L
Di-n-octyl phthalate	NNS to 2800 µg / L

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Napthalene	NNS to 140 µg / L
Silver	NNS to 35 µg / L

ADEQ updated the DWS criteria for the following parameters using new or revised q1*s, Rfds, or Minimum Risk Levels (MRLs). In some cases, criteria were changed to NNS because Rfds or q1*s have been withdrawn and are no longer available. Finally, some criteria were found to be incorrect because of decimal misplacement or were revised because a different rounding convention was used.

Acrolein	110 µg / L to 3.5 µg / L
Benz (a) anthracene	0.003 µg / L to NNS
Benzo (k) fluoranthene	0.003 µg / L to NNS
3, 4 - Benzo(a)fluoranthene	0.003 µg / L to NNS
Chrysene	0.003 µg / L to NNS
Copper	1000 µg / L to 1300 µg / L
Dibenz (ah) anthracene	0.003 µg / L to NNS
1,3-Dichlorobenzene	94 µg / L to NNS
1, 3-Dichloropropene	0.2 µg / L to 2 µg / L
thyl phthalate	70,000 µg / L to NNS
4, 6 -Dinitro-o-cresol	2.7 µg / L to 28 µg / L
Endosulfan sulfate	0.35 µg / L to NNS
Endrin aldehyde	2.1 µg / L to NNS
Indeno (1,2,3 - cd) pyrene	0.003 µg / L to NNS
Isophorone	36.8 µg / L to 37 µg / L
Lead	50 µg / L to 15 µg / L
Manganese	4900 µg / L to 980 µg / L
Nickel	100 µg / L to 140 µg / L
N-nitrosodimethylamine	0.0007 µg / L to 0.001 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000003 µg / L to 0.00003 µg / L

Update fish consumption criteria in Appendix A.

In the last triennial review, ADEQ derived water quality criteria for the fish consumption designated use using the following equation for carcinogens:

$$70 \times 10^{-6}$$

$$q_1^* \times 0.0065 \times \text{BCF}$$

ADEQ derived water quality criteria for the fish consumption designated use for non-carcinogens using the following equation:

$$\text{RfD} \times 70$$

$$0.0065 \times \text{BCF}$$

In these equations, 70 is the average weight of the human male in kilograms, 10^{-6} is the excess cancer risk level, 0.0065 is the national average fish consumption rate in kilograms per day, BCF is the bioconcentration factor in L / kg, q_1^* is the cancer potency slope in mg / kg / day, and Rfd is the reference dose in mg / kg / day.

The fish consumption value of 6.5 grams per day used in the above equations is based upon the national average fish consumption value that EPA used to calculate its § 304(a) national criteria recommendations in 1980. Since the state's adoption of fish consumption criteria based on a 6.5 grams / day fish consumption rate, EPA has issued new guidance on how to derive fish consumption criteria entitled Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft (U.S. Environmental Protection Agency, Office of Water, EPA-822-B-98-005 (July 1998)). EPA now recommends a hierarchy of preferences for developing fish consumption rates that states can use to derive appropriate water quality criteria.

First, EPA recommends that states look to site-specific information on fish consumption rates to develop appropriate fish consumption criteria, with priority given to identifying fish consumption rates of highly exposed populations within a state, particularly sport and subsistence fishermen. Unfortunately, ADEQ does not have reliable data regarding fish consumption rates by sport or subsistence fishermen in Arizona that can be used to develop a more site-specific fish consumption rate for Arizona.

Second, EPA recommends that states use data from fish consumption surveys conducted in similar geographic areas and population groups. The EPA technical support document includes descriptions of a number of such surveys, but none of the cited studies were conducted in geographic areas similar to Arizona.

Third, EPA recommends that states use information on the intake of fish from national food consumption surveys. EPA recommends that states use national data from the combined 1989, 1990, 1991 Continuing Survey of Food Intake by Individuals survey conducted by the U.S. Department of Agriculture (CSFII). EPA presents a detailed set of fish consumption tables from the CSFII in its technical guidance document. The tables indicate various fish consump-

tion rates for adults, children under 14, and women of child-bearing age (considered to be ages 15 - 44). Based on the national CSFII data, EPA now recommends revised default fish consumption rates of 17.80 grams / day for the general adult population and sport fishermen and 86.30 grams / day for subsistence fishermen. These default consumption rates include consumption of both store-bought and sport-caught fish.

ADEQ considered whether the current methodology to derive the fish consumption criteria should be revised to incorporate a higher fish consumption rate of 17.80 grams / day as recommended by EPA for the general adult population and for sport fishermen. ADEQ decided not to revise the state's current fish consumption criteria using the national fish consumption rate derived from the CSFII because of uncertainty regarding whether the national fish consumption rate, which includes consumption of both sport-caught and store-bought fish, was appropriate for the protection of the health of persons who consume fish taken from Arizona surface waters. Uncertainty over the applicability of the national fish consumption rate exists for two reasons. First, the EPA technical guidance document states that data on national distributions of fish intake by sport fishers and subsistence fishers are unavailable. EPA states in the technical guidance that because of a lack of information on national estimates for fish consumption by sport fishermen, the 17.80 grams / day rate, which approximates the 90th percentile fish intake rate from the CSFII, was *assumed* to represent the average non-marine fish consumption rate of the sport fishermen population. Second, EPA's presentation of information on regional break-outs of the national data set for the CSFII in its technical guidance document calls the application of the national 17.80 grams / day rate into question. The following table is taken from EPA's technical guidance document and it presents regional fish consumption data for the Mountain West states, including Arizona:

Distribution of Finfish and Shellfish Consumption: Mountain

Fresh / Estuarine Fish	
Statistic	Estimate (g/day)
Mean	3.23
50th Percentile	0.00
90th Percentile	0.48
95th Percentile	20.90
99th Percentile	78.60
All Fish (including marine fish)	
Mean	11.20
50th Percentile	0.00
90th Percentile	39.32
95th Percentile	58.55
99th Percentile	95.84

Source: Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft, U.S. Environmental Protection Agency, Office of Water, EPA-822-B-98-005, July 1998, p. 116.

The mean estimated fish consumption rate in grams / day for fresh water fish in the Mountain West region is 3.23 grams / day and the estimated 90th percentile fish consumption rate is only 0.48 gram / day. These Mountain West fish consumption rates are considerably below the 17.80 grams / day that EPA assumes to be representative of fish consumption rates by sport fishermen and the general adult population nationally. Because of the lack of reliable fish consumption data for Arizona and uncertainty regarding the appropriateness of using the national fish consumption rate of 17.80 grams / day, ADEQ chose to maintain the current methodology for deriving water quality criteria for the fish consumption designated use. The water quality criteria for the fish consumption designated use in the proposed rules is calculated using the 6.5 grams / day fish consumption rate. This fish consumption rate is twice the mean fish consumption rate and more than 13 times the estimated 90th percentile fresh water fish consumption rate for the Mountain West Region. ADEQ decided not to change its current methodology for deriving fish consumption criteria in this triennial review because of the lack of reliable fish consumption data for Arizona.

Bioaccumulation and bioconcentration factors

Some pollutants have the capacity to bioconcentrate in the tissues of aquatic organisms. When this occurs there is a net increase in the amount of the pollutant within the organism. Thus, the concentration of a pollutant in an organism can exceed the concentration of the pollutant in the water column. The ratio of the pollutant concentration in the organism to the pollutant concentration in the water is called the bioconcentration factor, or BCF. In addition to bioconcentration, some pollutants accumulate in aquatic organisms by being passed up the food chain. Examples of pollutants that bioaccumulate include PCBs, DDT, and methyl mercury.

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Bioconcentration and bioaccumulation are important factors to consider when developing water quality criteria for the fish consumption (FC) designated use. Humans are at the top of the food chain and they can ingest pollutants that have accumulated in the tissues of the aquatic organisms they catch and consume. To protect human health, the water quality criteria for the FC designated use must be established at concentrations that are not harmful to human consumers. The criteria must take the bioaccumulation of pollutants in aquatic organisms into account.

ADEQ used BCFs that are both chemical-specific and Arizona-specific to derive FC criteria in previous triennial reviews. A complete discussion of the derivation of the BCFs that were used to derive FC water quality criteria is contained in the 1992 and 1996 human health rationale documents. ADEQ did not change the use of BCFs to derive water quality criteria for the FC designated use in this triennial review.

EPA recently proposed to use bioaccumulation factors (BAFs) to derive water quality criteria to protect human health [*See Ambient Water Quality Criteria Derivation Methodology - Human Health, Technical Support Document, Final Draft*, § 2.4.1, pp. 165-166]. A BAF is the ratio of a pollutant concentration in tissue to the concentration in water and it takes into account the uptake of pollutants through contaminated food, sediment, and water. Chemicals with larger BAFs reflect greater bioaccumulation in fish tissues compared to chemicals with lower BAFs. EPA now recommends that states use BAFs instead of BCFs to derive water quality criteria. This contrasts with EPA's 1980 AWQC National Guidelines for deriving human health criteria. EPA previously relied on BCFs to derive human health criteria. In contrast to the BAF, the BCF measures the uptake of chemicals into fish that have been exposed only through water, not food or sediment. EPA recommends the use of BAFs as being superior to BCFs for deriving water quality criteria to protect human health because BAFs account for uptake from all sources of waterborne exposure of a pollutant to an organism.

ADEQ reviewed EPA's technical recommendations and considered revising the methodology for deriving the water quality criteria for the FC designated use. ADEQ invited public comment on whether ADEQ should revise the current methodology for deriving fish consumption criteria to include BAFs instead of BCFs. After careful review of the comments and EPA's recommended guidance ADEQ has concluded that it does not have enough field data to support the use of BAFs to derive criteria for the FC designated use.

ADEQ adopted new criteria for the following pollutants for the FC designated use.

Dalapon	161,500 µg / L
1,2 - Dichloropropane	NNS to 236,000 µg / L
Glyphosate	1,077,000 µg / L
Napthalene	NNS to 20,500 µg / L
Picloram	24,300 µg / L
Silver	NNS to 107,700 µg / L
Trichloroethylene	NNS to 203,200 µg / L

ADEQ revised the criteria for the following pollutants for the FC designated use based upon revised q1*s or Rfids, the withdrawal or unavailability of q1*s or Rfids, or changes in rounding conventions:

Acenaphthene	2,600 µg / L to 2670 µg / L
Acrolein	750 µg / L to 25 µg / L
Acrylonitrile	0.64 µg / L to 0.7 µg / L
Aldrin	0.0003 µg / L to 0.0001 µg / L
Anthracene	6,300 µg / L to 1,000 µg / L
Antimony (T)	140 µg / L to 4,300 µg / L
Benzene	120 µg / L to 140 µg / L
Benzidine	0.002 µg / L to 0.001 µg / L
Benzo(a)anthracene	0.00008 µg / L to NNS
Benzo(a)pyrene	0.002 µg / L to 0.05 µg / L
Benzo(k)fluoranthene	0.00001 µg / L to NNS
3,4 - Benzofluoranthene	0.00004 µg / L to NNS
Beryllium (T)	0.21 µg / L to 1,130 µg / L
Bis (2-chloroisopropyl) ether	15,000 µg / L to 174,400 µg / L
Bromodichloromethane	22 µg / L to 46 µg / L
Bromoform	80 µg / L to 360 µg / L
Bromomethane	7,500 µg / L to 4,020 µg / L
Butyl benzyl phthalate	5,000 µg / L to 5,200 µg / L
Cadmium (T)	41 µg / L to 84 µg / L
Carbon tetrachloride	5.5 µg / L to 4 µg / L
Chlordane	0.001 µg / L to 0.002 µg / L
Chlorobenzene	500 µg / L to 20,900 µg / L
Chloroform	590 µg / L to 470 L
Chloronapthalene beta	13,000 µg / L to 4,300 µg / L
2-Chlorophenol	2,100 µg / L to 400 µg / L
Chromium III	67,000 µg / L to 1,010,000 µg / L
Chromium VI	3,400 µg / L to 2,000 µg / L

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Chrysene	.0001 µg / L to NNS
Cyanide	210,000 µg / L to 215,000 µg / L
Dibenz (ah) anthracene	0.00003 µg / L to NNS
Dibromochloromethane	12 µg / L to 34 µg / L
Dibutyl phthalate	2300 µg / L to 12,100 µg / L
1,3 - Dichlorobenzene	2,000 µg / L to NNS
1,4 - Dichlorobenzene	1,200 µg / L to 77,500 µg / L
3,3'-Dichlorobenzidine	0.09 µg / L to 0.08 µg / L
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.0009 µg / L to 0.001 µg / L
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.0006 µg / L to 0.001 µg / L
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.0005 µg / L to 0.0006 µg / L
1,2 - Dichloroethane	120 µg / L to 100 µg / L
1,1- Dichloroethylene	4.5 µg / L to 320 µg / L
1,2 - trans- Dichloroethylene	13,000 µg / L to 136,000 µg / L
Dichloromethane	480 µg / L to 1,600 µg / L
2,4 - Dichlorophenol	810 µg / L to 800 µg / L
1,3 - Dichloropropene	6.6 µg / L to 1,700 µg / L
Diethyl phthalate	110,000 µg / L to 118,000 µg / L
2,4 - Dimethylphenol	2,200 µg / L to 2,300 µg / L
Dimethyl phthalate	2,800,000 µg / L to NNS
4,6 - Dinitro -o-cresol	120 µg / L to 7,800 µg / L
2,4 - Dinitrophenol	5400 µg / L to 14,400 µg / L
2,4 - Dinitrotoluene	163 µg / L to 5,700 µg / L
1,2 - Diphenylhydrazine	0.25 µg / L to 0.5 µg / L
Endosulfan sulfate	0.78 µg / L to NNS
Endosulfan (total)	110 µg / L to 240 µg / L
Endrin	1.1 µg / L to 0.8 µg / L
Endrin aldehyde	0.81 µg / L to NNS
Ethylbenzene	110,000 µg / L to 28,700 µg / L
Fluoranthene	130 µg / L to 380 µg / L
Fluorene	580 µg / L to 14,400 µg / L
Hexachlorobenzene	0.002 µg / L to 0.001 µg / L
Hexachlorobutadiene	0.52 µg / L to 50 µg / L
Hexachlorocyclohexane alpha	0.03 µg / L to 0.01 µg / L
Hexachlorocyclohexane gamma	0.02 µg / L to 25 µg / L
Hexachlorocyclopentadiene	550 µg / L to 580 µg / L
Hexachloroethane	4.8 µg / L to 9 µg / L
Indeno (1,2,3-cd) pyrene	0.000003 µg / L to NNS
Isophorone	2,300 µg / L to 2,600 µg / L
Nickel	730 µg / L to 4,600 µg / L
Nitrobenzene	600 µg / L to 1,900 µg / L
N-nitrosodimethylamine	2.1 µg / L to 8 µg / L
N-nitrosophenylamine	14 µg / L to 16 µg / L
N-nitrosodi-n-propylamine	0.51 µg / L to 1.4 µg / L
Pentachlorophenol	8.2 µg / L to 1,000 µg / L
Phenol	6,500,000 µg / L to 1,000 µg / L
PCBs	0.00009 µg / L to 0.007 µg / L
Pyrene	1,100 µg / L to 10,800 µg / L
2,3,7,8-TCDD (Dioxin)	0.000000004 µg / L to 0.002 µg / L
Tetrachloroethylene	11 µg / L to 3,500 µg / L
Thallium	41 µg / L to 7.2 µg / L
Toluene	90,000 µg / L to 201,000 µg / L
Toxaphene	0.0008 µg / L to 0.001 µg / L
1,2,4-Trichlorobenzene	155 µg / L to 950 µg / L
1,1,2-Trichloroethane	31 µg / L to 42 µg / L
2,4,6 - Trichlorophenol	4.9 µg / L to 6.5 µg / L
Vinyl chloride	620 µg / L to 13 µg / L
Zinc	22,000 µg / L to 69,000 µg / L

Update full-body contact recreation criteria in Appendix A

The criteria for the full-body contact recreation (FBC) designated use are intended to protect people from exposure to pollutants when they are swimming. To derive FBC criteria, ADEQ made assumptions regarding possible human exposure to pollutants while swimming. Ingestion and dermal contact are two common exposure pathways to pollutants while swimming. However, there is little reliable data to support the derivation of FBC criteria based on dermal

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contact exposures to pollutants. Consequently, ADEQ developed the current FBC criteria based on assumptions regarding incidental oral ingestion of water while swimming.

A person may ingest some water when he or she swims in a surface water. ADEQ derived the current water quality criteria for FBC assuming an incidental water ingestion rate of 50 ml / day. This value was based upon EPA Superfund risk assessment guidelines that suggested that an average mouthful of water may be 50 ml. ADEQ derived the current FBC criteria assuming an exposure from ingesting 50 ml of water during an estimated average of 1 hour of swimming per day. The following equation was used to derive criteria for carcinogens:

$$\frac{70 \times 10^{-6}}{q_1^* \times 0.05 \text{ L / day}}$$

ADEQ derived water quality for noncarcinogens using the following equation:

$$\frac{\text{RfD} \times 70}{0.05 \text{ L / day}}$$

In these equations, 70 is the average weight of a human male in kilograms, 10^{-6} is the excess cancer risk level, 0.05 is the estimated water consumption rate due to swimming in liters / day, q_1^* is cancer potency slope in mg / kg / day, and Rfd is the reference dose in mg / kg / day.

The available literature on recreational exposures to pollutants combined with assumptions about the average mouthful of water ingested for every hour of total body contact recreation can be used to determine an alternative incidental ingestion rate. EPA now recommends an incidental water ingestion rate of 10 ml / day in the Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft, § 2.3.2.4, p. 123. This estimate is based on an assumption that an individual may be in total contact with surface water for 123 hours a year (that is, an hour of swimming per day throughout four summer months) and may ingest 30 ml of water per hour of total contact. EPA's recommended ingestion rate of 10 ml / day may be appropriate for situations where exposure to pollutants while swimming occurs for one hour daily for about 4 months. However, EPA recognizes that states in warmer climates may wish to use higher incidental water ingestion rates to protect individuals who may swim in lakes or rivers for a greater portion of the year. ADEQ considered revising the current incidental ingestion rate of 50 ml / day to EPA's recommended incidental ingestion rate of 10 ml / day for the FBC designated use. However, ADEQ decided to retain the higher incidental water ingestion rate of 50 ml / day because of Arizona's warmer climate and the potential for greater exposure to pollutants by swimming.

ADEQ revised some FBC criteria that are artificially low because of a policy decision that was made in a previous triennial review relating to the derivation of criteria for the partial-body contact recreation designated use. After ADEQ derived numeric criteria for the FBC and PBC designated uses in the 1992 triennial review, ADEQ found that for some pollutants, the numeric criterion for the FBC designated use was less stringent than the numeric criterion calculated to protect the PBC designated use. For other pollutants the FBC criterion was more stringent than the water quality criterion for the DWS designated use. Based on common sense assumptions regarding relative exposures to pollutants in surface water, one would expect that the FBC criteria would be more stringent than the criteria for the PBC designated use and less stringent than the DWS criteria. However, the numeric criteria for the DWS, FBC, and PBC designated uses did not always reflect this logic because different methodologies were used to derive the criteria for each designated use. Consequently, ADEQ made two policy decisions regarding the FBC criteria in the 1992 triennial review. First, whenever a calculated numeric criterion for the FBC designated use was less stringent than the numeric criterion to protect the PBC designated use, ADEQ "defaulted" to the more stringent criterion. Second, whenever a FBC criterion was calculated to be more stringent than a DWS criterion, the DWS criterion was used to maintain and protect water quality for the FBC designated use. In the latter case, this occurred for four pollutants that had a less stringent DWS criterion based on MCLs with an excess cancer risk level higher than 10^{-6} . ADEQ continues to believe that the use of Safe Drinking Water Act MCLs to protect the FBC designated use is reasonable, even when the MCL is less stringent than a criterion calculated using the FBC methodology.

ADEQ used a PBC criteria derivation methodology suggested by the regulated community during the 1992 triennial review and published in Proposed Human Health Ambient Water Quality Standards for Arizona, (EBASCO Environmental, 1990). ADEQ has decided to abandon the EBASCO methodology that was used to calculate the PBC criteria in previous triennial reviews. Also, ADEQ no longer believes that it makes sense to "default" to more stringent criteria for the PBC designated use that were calculated using the EBASCO methodology. ADEQ revised the criteria derivation methodology for the PBC designated use because the PBC criteria were calculated using the EBASCO methodology that utilized an incidental water ingestion rate that is 10 times higher than the exposure assumption used to derive the FBC criteria. ADEQ has reconsidered the exposure assumptions used in the EBASCO methodology to calculate the PBC criteria. An incidental water ingestion rate for the PBC designated use that is 10 times higher than that used for the FBC designated use is unreasonable. ADEQ continues to rely on an assumed incidental water ingestion rate as a surrogate measure to derive criteria for the PBC designated use. However, ADEQ rejects the use of an incidental water ingestion rate for PBC that is 10 times higher than the one used for the FBC designated use. ADEQ decided to use the same methodology to derive water quality criteria for both the FBC and PBC designated uses in this triennial review. The result of this proposed approach is that ADEQ will no longer "default" to more stringent

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PBC criteria. The practical result of this approach is that many FBC criteria become less stringent by a factor of 10. Also, ADEQ updated the criteria for FBC and PBC designated uses using current q1*s and Rfds from IRIS.

ADEQ adopted new criteria for the following pollutants for the FBC designated use:

Chromium (total)	NNS to 100 µg / L
Dalapon	42,000 µg / L
1,2-cis-Dichloroethylene	NNS to 70 µg / L
1,2-Dibromo-3-chloropropane	2,800 µg / L
1,2-Dichloropropane	NNS to 126,000 µg / L
Di (2-ethylhexyl) adipate	1,200 µg / L
2,6-Dinitrotoluene	NNS to 2 µg / L
Di-n-octyl-phthalate	NNS to 560,000 µg / L
Dinoseb	1,400 µg / L
Diquat	3,080 µg / L
Endothall	28,000 µg / L
Glyphosate	140,000 µg / L
Lead	NNS to 15 µg / L
Napthalene	NNS to 28,000 µg / L
Oxamyl	35,000 µg / L
Picloram	98,000 µg / L
Silver	NNS to 7,000 µg / L
Simazine	7,000 µg / L
1,1,1-Trichloroethane	NNS to 200 µg / L
Trichloroethylene	NNS to 280,000 µg / L

ADEQ revised the following numeric criteria for the FBC designated use:

Acenaphthene	8,400 µg / L to 84,000 µg / L
Acrolein	2,200 µg / L to 700 µg / L
Alachlor	1,400 µg / L to 14,000 µg / L
Anthracene	42,000 µg / L to 420,000 µg / L
Antimony	56 µg / L to 560 µg / L
Atrazine	4,900 µg / L to 49,000 µg / L
Barium	9,800 µg / L to 98,000 µg / L
Benzene	48 µg / L to 93 µg / L
Benzidine	0.006 µg / L to 0.01 µg / L
Benz(ah)anthracene	0.12 µg / L to NNS
Benzo(k)fluoranthene	0.12 µg / L to NNS
3,4-Benzofluoranthene	0.12 µg / L to NNS
Beryllium	4 µg / L to 2,800 µg / L
Bis (2-chloroisopropyl) ether	5,600 µg / L to 56,000 µg / L
Boron	12,600 µg / L to 126,000 µg / L
Bromomethane	200 µg / L to 2,000 µg / L
Butyl benzyl phthalate	28,000 µg / L to 280,000 µg / L
Cadmium	70 µg / L to 700 µg / L
Carbofuran	700 µg / L to 7,000 µg / L
Chlordane	2 µg / L to 4 µg / L
Chlorine (total residual)	14,000 µg / L to 140,000 µg / L
Chlorobenzene	2,800 µg / L to 28,000 µg / L
Chloronapthalene beta	11,000 µg / L to 112,000 µg / L
2-Chlorophenol	700 µg / L to 7,000 µg / L
Chromium III	140,000 µg / L to 2,100,000 µg / L
Chromium VI	700 µg / L to 4,200 µg / L
Chrysene	0.12 µg / L to NNS
Copper	5,200 µg / L to 1,300 µg / L
Cyanide	2,800 µg / L to 28,000 µg / L
Dibenz (ah) anthracene	0.12 µg / L to NNS
Dibromochloromethane	17 µg / L to TTHM
1,2-Dibromoethane (EDB)	1.6 µg / L to 0.05 µg / L
Dibutyl phthalate	14,000 µg / L to 140,000 µg / L
1,2-Dichlorobenzene	13,000 µg / L to 126,000 µg / L
1,3-Dichlorobenzene	1,880 µg / L to NNS
1,4-Dichlorobenzene	1,880 µg / L to 560,000 µg / L
1,1-Dichloroethylene	7 µg / L to 230 µg / L
1,2-trans-Dichloroethylene	2,800 µg / L to 28,000 µg / L
2,4-Dichlorophenol	420 µg / L to 4,200 µg / L

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2,4-Dichlorophenoxyacetic acid (2,4-D)	1,400 µg / L to 14,000 µg / L
1,3-Dichloropropene	7.8 µg / L to 420 µg / L
Diethyl phthalate	110,000 µg / L to 1,120,000 µg / L
2,4-Dimethylphenol	2,800 µg / L to 28,000 µg / L
Dimethyl phthalate	1,400,000 µg / L to NNS
4,6-Dinitro-o-cresol	55 µg / L to 5,600 µg / L
2,4-Dinitrophenol	280 µg / L to 2,800 µg / L
2,4-Dinitrotoluene	280 µg / L to 2,800 µg / L
Endosulfan sulfate	7 µg / L to NNS
Endosulfan (total)	840 µg / L to 8,400 µg / L
Endrin	40 µg / L to 420 µg / L
Endrin aldehyde	420 µg / L to NNS
Ethylbenzene	14,000 µg / L to 140,000 µg / L
Fluoranthene	5,600 µg / L to 56,000 µg / L
Fluorene	5,600 µg / L to 56,000 µg / L
Fluoride	8,400 µg / L to 84,000 µg / L
Hexachlorocyclohexane gamma (lindane)	1 µg / L to 420 µg / L
Hexachlorocyclopentadiene	1,000 µg / L to 9,800 µg / L
Indeno (1,2,3-cd) pyrene	0.12 µg / L to NNS
Manganese	19,600 µg / L to 196,000 µg / L
Mercury	42 µg / L to 420 µg / L
Methoxychlor	700 µg / L to 7,000 µg / L
Nickel	2,800 µg / L to 28,000 µg / L
Nitrate	224,000 µg / L to 2,240,000 µg / L
Nitrite	14,000 µg / L to 140,000 µg / L
Nitrobenzene	70 µg / L to 700 µg / L
Pentachlorophenol	11.7 µg / L to 12 µg / L
Phenol	84,400 µg / L to 840,000 µg / L
Polychlorinated biphenyls (PCBs)	0.5 µg / L to 28 µg / L
Pyrene	4,200 µg / L to 42,000 µg / L
Selenium	700 µg / L to 7,000 µg / L
Styrene	28,000 µg / L to 280,000 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.00009 µg / L to 1.4 µg / L
Tetrachloroethylene	35 µg / L to 14,000 µg / L
Thallium	12 µg / L to 112 µg / L
Toluene	28,000 µg / L to 280,000 µg / L
Toxaphene	3 µg / L to 1.3 µg / L
1,2,4-Trichlorobenzene	1,400 µg / L to 14,000 µg / L
2-(2,4,5-Trichlorophenoxy) propionic acid	1,120 µg / L to 11,200 µg / L
Vinyl chloride	80 µg / L to 2 µg / L
Xylenes	280,000 µg / L to 2,800,000 µg / L
Zinc	42,000 µg / L to 420,000 µg / L

Recalculation of the partial-body contact recreation (PBC) water quality criteria

In the 1992 triennial review of surface water quality standards, ADEQ proposed that no water quality criteria be adopted for the PBC designated use because of the lack of an accepted methodology to derive the criteria and a lack of data regarding incidental ingestion of water or dermal exposures to pollutants. During the 1992 triennial review, a methodology to derive water quality criteria for the PBC designated use was recommended by members of the regulated community. The recommendations were published in Proposed Human Health Ambient Water Quality Standards for Arizona (EBASCO Environmental, et. al., 1990). The EBASCO recommendations for deriving criteria for the PBC designated use included the following:

1. The PBC designated use would be applied to ephemeral waters and effluent dominated waters whose primary use is aesthetic and whose flow characteristics limit the likelihood of exposure. It is proposed that the definition of PBC relate to the frequency and duration of incidental exposure based on the expected use of these waters. PBC should be defined in a toxicologically relevant manner that permits a dose estimate to be made. Because exposure through ingestion or exposure to sensitive body organs is unlikely to occur, then those instances of exposure can be assumed to be infrequent and to occur at sporadic intervals.
2. The relevant human health concern for purposes of establishing water quality standards for PBC is from acutely toxic effects and not from effects that cause chronic toxicity.
3. If acutely toxic health effects are possible, then consideration of a "maximally exposed individual" is appropriate instead of the most likely exposed individual.
4. The maximally exposed individual could be postulated to be one who may have consumed as much as 0.5 liter (about 1 pint) of water during a single day or who incidentally consumed an equal amount as a result of several expo-

tures. The most likely exposure would be a person who immersed part of his or her body (for example, waded) in the water.

5. It is recommended that the short term health advisory value be used to establish the permissible water limits for chemical contaminants and that this should be corrected for the consumption of 0.5 liter instead of 2 liters.

6. If health advisory levels are unavailable, then it is proposed that reference dose (Rfd) based on chronic oral administration be used and, if appropriate, adjusted upward to reflect the need to protect against acute toxicity. It is proposed that the dose for a 70 kg adult be calculated and an allowable water concentration based on a 0.5 liter consumption.

7. If health advisory levels are unavailable, it is proposed that a non-carcinogenic risk assessment be used based on No Observed Adverse Effects Levels (NOAEL) determined from short term toxicity data and the numbers be adjusted with safety factors based on EPA protocols used to produce health advisory levels. If insufficient toxicological data are available for a particular compound, then data for analogous compounds should be used. This may be appropriate for certain polynuclear aromatic hydrocarbons, phenols, and phthalate esters.

ADEQ followed the EBASCO recommendations to derive water quality criteria for the PBC designated use. The EBASCO approach was admittedly conservative and probably more stringent than what was necessary to protect human health from the types of exposures to pollutants normally expected during partial-body contact recreation. The exposure assumption of 0.5 liter of water ingested incidentally or accidentally during a single day of partial-body contact recreation was used to derive the PBC criteria. ADEQ used the following decision hierarchy to derive criteria for PBC:

1. Use one-day children's health advisories to protect the PBC designated use where available,
2. Use the EBASCO method to derive PBC criteria and assume that the "maximally exposed individual" will ingest 0.5 liters of water during partial-body contact recreation.
3. If an MCL is less stringent than the PBC criterion that results from using either the one-day children's health advisory or the EBASCO method, then use the MCL.

As noted earlier, a common sense approach based on expected exposures to pollutants in surface water should result in water quality criteria for PBC that are less stringent than FBC criteria and FBC criteria that are less stringent than the DWS criteria. However, as noted earlier, the human health criteria in Table 1 of Appendix A did not always reflect this logic because of differences in the methodologies that were used to derive the criteria for each designated use. Sometimes, a PBC criterion was calculated using the EBASCO methodology that was more stringent than the FBC criterion for the same pollutant. Whenever this happened, ADEQ "defaulted" to the more stringent PBC criterion and the more stringent PBC criterion was adopted for both the FBC and PBC designated uses.

ADEQ has reconsidered the use of the EBASCO methodology to derive water quality for the PBC designated use. ADEQ believes that the use of the EBASCO methodology drives both the FBC and PBC human health criteria to overly stringent levels. ADEQ proposes to abandon the EBASCO methodology for deriving criteria for the PBC designated use because the methodology uses an unreasonable incidental water ingestion exposure assumption. The EBASCO incidental ingestion rate for PBC (0.5 liter or 500 µg/L) is 10 times the incidental ingestion rate used to derive the FBC criteria (0.05 mg / L or 50 µg/L). Common sense tells us that the incidental water ingestion rates for the two designated uses should be reversed. That is, the incidental water ingestion rate assumed for FBC should be higher than the assumed incidental water ingestion rate for PBC. ADEQ believes that the incidental ingestion rate of 0.05 mg/L for the FBC designated use is a more reasonable exposure assumption for the PBC designated use. In the absence of reliable data to derive PBC criteria based on dermal exposures or another incidental water ingestion rate, ADEQ proposes to rely on the exposure assumptions in the FBC methodology to derive criteria for *both* the FBC and PBC designated uses. A FBC criterion should be adequately protective of water quality for the PBC designated use. If one can safely swim in a surface water, it should be adequately protected for partial-body contact recreation.

Finally, ADEQ proposes to employ only noncarcinogenic endpoints to derive criteria for PBC. This approach is consistent with the EBASCO methodology recommendation to use reference doses (Rfd) based on oral ingestion. Carcinogenic endpoints are not appropriate for the derivation of PBC criteria because carcinogenic endpoints are based upon lifetime, chronic exposures to pollutants. Lifetime, chronic exposures to pollutants are not expected through partial-body contact recreation.

ADEQ used the following methodology to derive PBC criteria:

Rfd x 70

0.05

Where Rfd is the reference dose, 70 is the average weight of the human male in kilograms, and 0.05 is estimated incidental water ingestion rate in liters per day. This is the same methodology that ADEQ used to derive FBC criteria for noncarcinogens.

Where an Rfd for a pollutant was not available, ADEQ used Minimum Risk Levels (MRLs) for hazardous substances developed by the Agency for Toxic Substances and Disease Registry (ATSDR) to derive PBC criteria. ATSDR's development of MRLs is a response to a mandate found in the Comprehensive Environmental Response, Compensa-

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tion, and Liability Act as amended by the Superfund Amendments and Reauthorization Act. Federal Superfund law requires ATSDR, in cooperation with EPA, to develop a list of hazardous substances commonly found at Superfund sites, prepare toxicological profiles for each substance included on the list of hazardous substances, and ascertain significant human exposure levels for hazardous substances in the environment and the associated acute, subacute, and chronic human health effects.

An ATSDR Minimum Risk Level is similar to a reference dose (Rfd). A MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of an adverse non-cancer health effect over a specified duration of exposure. MRLs are derived for acute (1 to 14 days), intermediate (15 to 364 days), and chronic exposures (365 days or longer) and for oral and inhalation routes of exposure. Currently, MRLs for the dermal route of exposure are not derived because ATSDR has not yet identified a method suitable for this route of exposure. ADEQ decided to use MRLs for oral exposure to derive PBC criteria when an Rfd is not available. ADEQ used chronic oral exposure MRLs first, intermediate exposure MRLs if chronic exposure MRLs were unavailable, and acute oral exposure MRLs if both chronic and intermediate oral exposure MRLs were unavailable. The MRL was substituted in the above equation for the Rfd.

MRLs are intended to serve as screening levels to identify contaminants with potential health effects of concern. MRLs are derived only when ATSDR determines that reliable and sufficient data exist to identify target organs or the most sensitive health effect for a specific duration for a given route of exposure to a hazardous substance. Like RfDs, MRLs are based on noncancer health effects only. Oral MRLs are expressed as daily human doses in units of milligrams per kilogram per day (mg / kg / day).

ATSDR uses a no observed adverse effect level / uncertainty factor approach to derive MRLs for hazardous substances. The MRLs are set below levels that, based on current information, might cause adverse health effects in people who are most sensitive to a substance-induced health effect. The MRLs are generally based on the most sensitive substance-induced end point that ATSDR considers to be of relevance to humans. MRLs contain uncertainty because of the lack of precise toxicological information on vulnerable populations who may be most sensitive to the effects of hazardous substances (e.g., infants, elderly, and immunologically compromised people). For this reason, ATSDR uses a conservative approach to address these uncertainties consistent with the public health principle of prevention. Although human health effects data are preferred, MRLs often are based on animal studies because relevant human health effects studies are lacking. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive than animals to the effects of hazardous substances and that certain persons may be particularly sensitive to exposure to hazardous substances [for example, immunologically compromised persons]. Thus, an MRL may be set at a level below that which is shown to be nontoxic in animals.

MRLs undergo a rigorous review process. They are reviewed by the Health Effects / MRL Workgroup within the ATSDR Division of Toxicology; an expert panel of external peer reviewers, and an agency-wide MRL Workgroup with participation from other federal agencies, including EPA. MRLs also are submitted for public comment through a toxicological profile public comment period. Each MRL is subject to change as new information becomes available and the toxicological profile for a hazardous substance is updated. ADEQ derived PBC criteria using MRLs for 17 pollutants. The pollutants are: acrolein, acrylonitrile, hexachlorocyclohexane-alpha, hexachlorocyclohexane-beta, 1,4-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2-dichloroethane, 1,2-dichloropropane, 4,6-dinitro-o-cresol, 2,6-dinitrotoluene, di-n-octyl phthalate, hexachlorobutadiene, N-nitrosodi-n-propylamine, 2,3,7,8-tetrachlorodibenzo-p-dioxin, 1,1,2,2-tetrachloroethane, toxaphene, and trichloroethylene.

For pollutants identified as carcinogens with q1*s, but that do not have a Rfd or MRL available, ADEQ used the full-body contact criterion to protect the partial-body contact designated use. This situation occurred for eight pollutants, including benzene, benzo(a)pyrene, bis (chloroethyl) ether, 1,2-diphenylhydrazine, n-nitrosodimethylamine, n-nitrosodiphenylamine, 1,1,1-trichloroethane, and 2,4,6-trichlorophenol.

For pollutants for which there is no q1*, Rfd, or MRL but there was an MCL or an action level [for example, lead and copper], ADEQ used the MCL or action level to protect the partial-body contact designated use. This situation occurred for five pollutants, including total chromium, copper, 1,2-dibromoethane, 1,2-cis-dichloroethylene, and lead.

ADEQ adopted new criteria for the PBC designated use for the following pollutants:

Acrylonitrile	NNS to 56,000 µg / L
Benzene	NNS to 93 µg / L
Benzo(a)pyrene	NNS to 0.2 µg / L
Bis (2-chloroethyl) ether	NNS to 1.3 µg / L
Chromium (total)	NNS to 100 µg / L
Dalapon	42,000 µg / L
1,2-Dibromo-3-chloropropane (DBCP)	NNS to 2,800 µg / L
1,2-Dibromoethane (EDB)	NNS to 0.05 µg / L
3,3'-Dichlorobenzidine	NNS to 3.1 µg / L
p,p'-Dichlorodiphenyldichloroethane (DDD)	NNS to 5.8 µg / L
p,p'-Dichlorodiphenyldichloroethylene (DDE)	NNS to 4.1 µg / L
1,2-Dichloroethane	NNS to 280,000 µg / L

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1,2-Dichloropropane	NNS to 126,000 µg / L
1,2-cis-Dichloroethylene	NNS to 70 µg / L
Di (2-ethylhexyl) adipate	840,000 µg / L
2,6-Dinitrotoluene	NNS to 5,600 µg / L
Di-n-octyl-phthalate	NNS to 560,000 µg / L
Dinoseb	1,400 µg / L
1,2-Diphenylhydrazine	NNS to 1.8 µg / L
Diquat	3,080 µg / L
Endothall	28,000 µg / L
Glyphosate	140,000 µg / L
Hexachlorobutadiene	NNS to 280 µg / L
Hexachlorocyclohexane alpha	NNS to 11,200 µg / L
Hexachlorocyclohexane beta	NNS to 840 µg / L
Lead	NNS to 15 µg / L
Napthalene	NNS to 28,000 µg / L
N-Nitrosomethylamine	NNS to 0.03 µg / L
N-Nitrosodiphenylamine	NNS to 290 µg / L
N-Nitrosodi-n-propylamine	NNS to 133,000 µg / L
Oxamyl	35,000 µg / L
Picloram	98,000 µg / L
Polychlorinated biphenyls (PCBs)	NNS to 28 µg / L
Silver	NNS to 7,000 µg / L
Simazine	7,000 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	NNS to 1.4 µg / L
1,1,2,2-Tetrachloroethane	NNS to 56,000 µg / L
Toxaphene	NNS to 1,400 µg / L
1,1,1-Trichloroethane	NNS to 200 µg / L
Trichloroethylene	NNS to 280,000 µg / L
2,4,6-Trichlorophenol	NNS to 130 µg / L
Vinyl chloride	NNS to 4,200 µg / L

ADEQ revised the numeric criteria for the PBC designated use as follows:

Acenaphthene	8,400 µg / L to 84,000 µg / L
Acrolein	2,200 µg / L to 700 µg / L
Alachlor	1,400 µg / L to 14,000 µg / L
Aldrin	4.2 µg / L to 42 µg / L
Anthracene	42,000 µg / L to 420,000 µg / L
Antimony	56 µg / L to 560 µg / L
Arsenic	50 µg / L to 420 µg / L
Atrazine	4,900 µg / L to 49,000 µg / L
Barium	9,800 µg / L to 98,000 µg / L
Benzidine	420 µg / L to 4,200 µg / L
Beryllium	700 µg / L to 2,800 µg / L
Bis (2-chloroisopropyl) ether	5,600 µg / L to 56,000 µg / L
Boron	12,600 µg / L to 126,000 µg / L
Bromodichloromethane	2,800 µg / L to 28,000 µg / L
Bromoform	2,800 µg / L to 28,000 µg / L
Bromomethane	200 µg / L to 2,000 µg / L
Butyl benzyl phthalate	28,000 µg / L to 280,000 µg / L
Cadmium	70 µg / L to 700 µg / L
Carbofuran	700 µg / L to 7,000 µg / L
Carbon tetrachloride	98 µg / L to 980 µg / L
Chlordane	8.4 µg / L to 700 µg / L
Chlorine (total residual)	14,000 µg / L to 140,000 µg / L
Chlorobenzene	2,800 µg / L to 28,000 µg / L
Chloroform	1,400 µg / L to 14,000 µg / L
Chloronaphthalene beta	11,000 µg / L to 112,000 µg / L
2-Chlorophenol	700 µg / L to 7,000 µg / L
Chromium III	140,000 µg / L to 2,100,000 µg / L
Chromium VI	700 µg / L to 4,200 µg / L
Copper	5,200 µg / L to 1,300 µg / L
Cyanide	2,800 µg / L to 28,000 µg / L
Dibromochloromethane	2,800 µg / L to 28,000 µg / L
Dibutyl phthalate	14,000 µg / L to 140,000 µg / L
1,2-Dichlorobenzene	13,000 µg / L to 126,000 µg / L

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1,3-Dichlorobenzene	1,880 µg / L to NNS
1,4-Dichlorobenzene	1,880 µg / L to 560,000 µg / L
p,p'-Dichlorodiphenyltrichloroethane (DDT)	70 µg / L to 700 µg / L
1,1-Dichloroethylene	1,300 µg / L to 12,600 µg / L
1,2-trans-Dichloroethylene	2,800 µg / L to 28,000 µg / L
Dichloromethane	8,400 µg / L to 84,000 µg / L
2,4-Dichlorophenol	420 µg / L to 4,200 µg / L
2,4-Dichlorophenoxyacetic acid (2,4-D)	1,400 µg / L to 14,000 µg / L
1,3-Dichloropropene	42 µg / L to 420 µg / L
Dieldrin	7 µg / L to 70 µg / L
Diethyl phthalate	110,000 µg / L to 1,120,000 µg / L
Di (2-ethylhexyl) phthalate	2,800 µg / L to 28,000 µg / L
2,4-Dimethylphenol	2,800 µg / L to 28,000 µg / L
Dimethyl phthalate	1,400,000 µg / L to NNS
4,6-Dinitro-o-cresol	55 µg / L to 5,600 µg / L
2,4-Dinitrophenol	280 µg / L to 2,800 µg / L
2,4-Dinitrotoluene	280 µg / L to 2,800 µg / L
Endosulfan sulfate	7 µg / L to NNS
Endosulfan (total)	840 µg / L to 8,400 µg / L
Endrin	40 µg / L to 420 µg / L
Endrin aldehyde	420 µg / L to NNS
Ethylbenzene	14,000 µg / L to 140,000 µg / L
Fluoranthene	5,600 µg / L to 56,000 µg / L
Fluorene	5,600 µg / L to 56,000 µg / L
Fluoride	8,400 µg / L to 84,000 µg / L
Heptachlor	70 µg / L to 700 µg / L
Heptachlor epoxide	2 µg / L to 18 µg / L
Hexachlorobenzene	280 µg / L to 1,120 µg / L
Hexachlorocyclohexane gamma (lindane)	42 µg / L to 420 µg / L
Hexachlorocyclopentadiene	1,000 µg / L to 9,800 µg / L
Hexachloroethane	140 µg / L to 1,400 µg / L
Isophorone	28,000 µg / L to 280,000 µg / L
Manganese	19,600 µg / L to 196,000 µg / L
Mercury	42 µg / L to 420 µg / L
Methoxychlor	700 µg / L to 7,000 µg / L
Nickel	2,800 µg / L to 28,000 µg / L
Nitrate	224,000 µg / L to 2,240,000 µg / L
Nitrite	14,000 µg / L to 140,000 µg / L
Nitrobenzene	70 µg / L to 700 µg / L
Pentachlorophenol	2000 µg / L to 42,000 µg / L
Phenol	84,000 µg / L to 840,000 µg / L
Pyrene	4,200 µg / L to 42,000 µg / L
Selenium	700 µg / L to 7,000 µg / L
Styrene	28,000 µg / L to 280,000 µg / L
Tetrachloroethylene	1,400 µg / L to 14,000 µg / L
Thallium	12 µg / L to 112 µg / L
Toluene	28,000 µg / L to 280,000 µg / L
1,2,4-Trichlorobenzene	1,400 µg / L to 14,000 µg / L
1,1,2-Trichloroethane	560 µg / L to 5,600 µg / L
2-(2,4,5-Trichlorophenoxy) propionic acid	1,120 µg / L to 11,200 µg / L
Xylenes	280,000 µg / L to 2,800,000 µg / L
Zinc	42,000 µg / L to 420,000 µg / L

Add Hardness / pH tables to Appendix A

Currently, there are four categories of aquatic life designated uses: 1) aquatic and wildlife (cold water fishery), 2) aquatic and wildlife (warm water fishery), 3) aquatic and wildlife (effluent-dependent water), and 4) aquatic and wildlife (ephemeral water). Each aquatic life subcategory has water quality criteria to protect organisms from acute and chronic toxicity. The toxicity of several pollutants is dependent upon either the hardness or the pH of the surface water. For example, the toxicity of cadmium, chromium III, copper, lead, nickel, silver, and zinc is a function of the hardness of a surface water. The toxicity of pentachlorophenol is dependent on the pH of a surface water. The current water quality criteria for these pollutants are expressed as mathematical equations with hardness or pH variables. The mathematical equations are "user-unfriendly." It is difficult for the average person to understand what the water quality standards are for hardness and pH-dependent pollutants when the standards are expressed as mathematical equations. ADEQ added tables to Appendix A for these parameters and calculated the acute and chronic criteria for a range of hardness and pH values. ADEQ updated the acute and chronic toxicity criteria for hardness- and pH-depen-

dent pollutants. ADEQ revised how the water quality criteria for the parameters are presented in the surface water quality standards rules. ADEQ retained the mathematical equations as the water quality standards but added the tables for the convenience of persons who consult and use the water quality standards rules. ADEQ hopes that the tables with a range of hardness and pH values and the corresponding acute and chronic aquatic life criteria will be more understandable than the mathematical equations that are in the current rules.

Update A&W criteria using recent toxicity data

ADEQ adopted numeric water quality criteria to protect four aquatic life designated uses. They are: 1) aquatic and wildlife-cold water (A&Wc), 2) aquatic and wildlife-warm water (A&Ww), 3) aquatic and wildlife - effluent-dependent water (A&Wedw), and 4) aquatic and wildlife - ephemeral water (A&We). Two methods were used to calculate acute and chronic criteria for the A&W designated uses where toxicity data was available. Both methods are described in detail in "Rationale for the Development of Toxic Pollutant Criteria to Protect Aquatic and Wildlife Designated Uses," Arizona Department of Environmental Quality, Water Quality Assessment Unit, March 13, 1996.

The first method is the method that EPA uses to derive national water quality criteria for freshwater under § 304(a) of the Clean Water Act (the "Guidelines procedure"). The Guidelines procedure is a statistically-based methodology designed to protect 95% of all species nationwide. The Guidelines procedure requires a minimum dataset of eight toxicity tests representing a variety of aquatic vertebrates and invertebrates. Species mean and genus mean values are calculated from the results of the toxicity tests and final acute or chronic values are calculated from the four lowest genus mean values.

The second method that ADEQ used to derive A&W criteria is called the LC₅₀ method. The LC₅₀ method was used to calculate criteria when insufficient data existed to apply the Guidelines procedure. Even with this methodology, ADEQ could not develop criteria for all of the priority pollutants because of a lack of toxicity data. Two primary factors distinguish the LC₅₀ method from the Guidelines procedure: 1) there are no minimum data set requirements for the LC₅₀ method, and 2) the LC₅₀ method is not a statistically-based method designed to provide aquatic life protection at a specific confidence level.

Toxicity data and bioconcentration factors used to calculate the criteria were obtained from EPA criteria documents. Toxicity data to derive criteria are intended to be representative of the respective aquatic life designated use. For example, the dataset used to calculate criteria for the A&Wc designated use includes cold water species (for example, trout). The dataset used to calculate criteria for the A&Ww designated use excludes cold water species. For the A&Wedw designated use, only toxicity data corresponding to species that have been found in EDWs were used to calculate criteria. Best professional judgment was used to compile a species list for ephemeral waters because of the lack of toxicity data on organisms inhabiting ephemeral waters in Arizona.

The use of different methodologies and modified data sets to derive criteria for the A&W designated uses sometimes resulted in the calculation of anomalous criteria. For example, ADEQ expected that water quality criteria derived using the Guidelines method would be the most stringent because the criteria are designed to protect 95% of all species nationally. However, in some cases, criteria derived for other aquatic life designated uses were more stringent. Consequently, ADEQ developed the following five-step decision guideline for the A&W criteria to address anomalies:

- A&W criteria are developed for each A&W designated use using the best available science and data.
- A&W criteria will not be designed to protect more than 95% of species nationally (except where site-specific criteria are proposed).
- If an A&Ww criterion is more stringent than an A&Wc criterion, the proposed A&Ww criterion will default to the proposed A&Wc criterion.
- If an A&Wedw criterion is more stringent than an A&Ww criterion, the proposed A&Wedw criterion will default to the A&Ww criterion
- If an A&We criterion is more stringent than an A&Ww criterion, the proposed A&We criterion will default to the A&Ww criterion.

The application of these decision guidelines results in A&Wc criteria that are always more stringent or equal to A&Ww criteria and A&Ww criteria that are always more stringent or equal to A&Wedw or A&We criteria.

ADEQ updated the aquatic and wildlife criteria for the pollutants listed in Appendix B using toxicity data from ECOTOX, a toxicology database maintained by the U. S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory.

ADEQ adopted new aquatic life criteria for the following pollutants:

Alachlor:	A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 2,500 µg / L A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 170 µg / L
Carbofuran:	A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 650 µg / L A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 50 µg / L
Chlorobenzene:	A&Wedw (acute): NNS to 3,800 µg / L A&Wedw (chronic): NNS to 260 µg / L

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Styrene: A&Wc (acute), A&Ww (acute) and A&Wedw (acute): 5600 µg / L
A&Wc (chronic), A&Ww (chronic) and A&Wedw (chronic): 370 µg / L

ADEQ revised the current aquatic life criteria and adopted more stringent criteria for the following pollutants and subcategories of aquatic life use:

Benzene: A&Wedw (acute): 11,000 µg / L to 8,800 µg / L
A&Wedw (chronic) 700 µg / L to 560 µg / L

Chlorobenzene: A&Wc (acute), A&Ww (acute): 9,800 µg / L to 3,800 µg / L
A&Wc (chronic), A&Ww (chronic): 620 µg / L to 260 µg / L

2,4-Dinitrotoluene: A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 15,000 µg / L to 14,000 µg / L
A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 970 µg / L to 860 µg / L

Napthalene A&Ww (acute), A&Wedw (acute): 3,300 µg / L to 3,200 µg / L
A&Ww (chronic), A&Wedw (chronic): 600 µg / L to 580 µg / L

Numeric ammonia criteria for aquatic life protection

Ammonia is a pollutant that is routinely found in wastewater treatment plant effluents, landfill leachates, and agricultural runoff from fields where commercial fertilizers and animal manure are applied. The control of the discharge of ammonia is necessary to protect aquatic life in Arizona's surface waters because ammonia has known toxic effects to aquatic life [See 1999 Update of Ambient Water Quality Criteria for Ammonia, U.S. Environmental Protection Agency, Office of Water, EPA-822-R-99-014, December, 1999].

In 1985, EPA published the first Ambient Water Quality Criteria for Ammonia document. This national criteria document contained ammonia criteria concentrations for the protection of freshwater aquatic life. The Criterion Maximum Concentration (CMC) applied to acute exposures, and the Criterion Continuous Concentration (CCC) applied to chronic or long-term exposures. The CMC and CCC varied according to pH and the type of fishery involved. EPA amended this criteria document in 1992.

In 1998, EPA published another update to the national criteria document for ammonia. The updated criteria document assessed the aquatic toxicity data for ammonia in freshwater and presented revised criteria to protect aquatic life. The revised ammonia criteria superseded EPA's previous criteria guidance for ammonia published in 1992. The 1998 criteria guidance for ammonia revised the acute and chronic ammonia criteria and the chronic averaging period. The acute and chronic criteria were expressed in terms of milligrams of ammonia nitrogen per liter and they varied with pH. The ammonia criteria for acute toxicity differed depending on whether salmonid species were present or not. For the chronic ammonia criteria, no substantial differences between salmonid and non-salmonid sensitivity were apparent and the chronic criteria did not vary according to the species of fish present (that is, according to the presence or absence of salmonids).

In 1999, EPA updated the national water quality criteria for ammonia again. EPA's 1999 Update reflects recent research and data on ammonia toxicity collected since 1984. The 1999 Update includes several revisions of elements of the previous criteria documents, including revisions to take into account newer data, better models, and improved statistical methods to address the temperature and pH-dependence of ammonia toxicity in freshwater. EPA's recommended criteria are expressed as concentrations of total ammonia nitrogen (in mg / L). The recommended acute criteria for ammonia are dependent on pH and the presence or absence of salmonids. The acute criteria values vary as a continuous function of pH and they are not dependent on temperature. EPA's recommended chronic criteria are dependent on pH and temperature. However, the recommended chronic criteria are not species-sensitive. The chronic criteria do not vary depending on the presence or absence of salmonids. However, at lower temperatures, the chronic criteria are dependent on the presence or absence of early life stages of fish. EPA's recommended chronic criteria gradually increase as temperature decreases. The chronic criteria are more stringent at temperatures below 15° C when early life stages of fish are expected to be present. EPA's 1999 Update differs from the 1998 Update primarily in the handling of the temperature-dependency of the chronic toxicity criteria for ammonia.

EPA recommends that states adopt numeric ammonia criteria applicable at all times of the year for all surface waters designated for the protection of aquatic life. Numeric ammonia criteria may be adopted based on EPA's national criteria recommendations for ammonia, national criteria modified to reflect site-specific conditions, or other scientifically defensible methods. EPA takes the position that numeric ammonia criteria can be adopted by states because EPA has published § 304(a) criteria for ammonia. There is a voluminous amount of data on ammonia toxicity to support the development of numeric criteria. EPA has stated in the Federal Register that the adoption of numeric criteria for ammonia is a high priority for triennial reviews of water quality standards that will occur in FY 2001 through FY 2003. EPA has stated its intention to federally promulgate numeric ammonia criteria where a state does not amend its water quality standards to include water quality criteria for ammonia that ensure protection of aquatic life designated uses.

Arizona currently has acute criteria for ammonia for the A&Wc and A&W designated uses in the surface water quality standards rules, but these acute criteria are based upon earlier versions of EPA's national criteria guidance. As noted above, EPA's previous ammonia criteria recommendations have been superseded by the 1999 Update. Therefore, ADEQ revised the numeric criteria for total ammonia to be consistent with EPA's recommendations in the 1999 Update.

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ADEQ adopted the following acute criteria for total ammonia (in mg N / L):

Acute Criteria for Total Ammonia (in mg N / L)		
pH	A&Wc	A&Ww
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

ADEQ currently does not have numeric criteria for chronic ammonia toxicity in the surface water quality standard rules. ADEQ adopted the temperature and pH-dependent chronic values recommended by EPA for waters with early life stages of fish present as the state's criteria to prevent chronic ammonia toxicity. The numeric criteria apply to surface waters in Arizona with the A&Wc and A&Ww designated uses.

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Chronic Criteria for Total Ammonia in mg N / L for A&Wc and A&Ww Designated Uses										
pH	Temperature, °C									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.33	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Proposed repeal of the chronic A&We criteria

Water quality criteria to protect aquatic life contain two expressions of allowable magnitude. Acute criteria are established to protect against short-term effects and chronic criteria are established to protect against long-term effects of pollutants. In general, EPA derives chronic criteria from longer term toxicity tests (often greater than 28-days) that measure survival, growth, and reproduction of test organisms. The term of these toxicity tests is often greater than the length of time that ephemeral waters typically flow in Arizona.

The surface water quality standard rules currently include an aquatic and wildlife designated use that applies to ephemeral waters (A&We). The A&We designated use has both acute and chronic criteria to protect aquatic life and wildlife. However, ADEQ has determined that chronic A&We criteria are unnecessary to protect the designated use. ADEQ defines an ephemeral water as a surface water that flows only in direct response to precipitation and that is at all times above the water table. Surface waters that flow continuously for 30 days or more are considered to be intermittent waters that are protected by A&Wc or A&Ww designated uses. The A&Wc and A&Ww designated uses have both acute and chronic criteria. ADEQ has determined that chronic criteria are unnecessary for ephemeral waters because they flow for less than 30 days at a time and the duration of exposure of organisms to pollutants is short-term. ADEQ therefore proposes to repeal all of the current chronic criteria for the A&We designated use.

Revised sulfide standard for lakes.

Arizona's lakes, reservoirs, and ponds are surface waters that are commonly referred to as lentic (still or slow water). They are the opposite of a lotic system, such as a stream or river, where water is continually moving and circulating. In most surface waters, the addition of oxygen occurs at the water's surface. In a stream or river, oxygen is circulated

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throughout the water column because the water is continually moving. In lakes and reservoirs, differences in chemical, physical, and biological characteristics can cause layers of water to form on top of one another. This process is called stratification. The layers of water can become fixed for long periods of time, preventing the circulation of oxygen into the deeper layers. This can cause the deeper areas of a lake or reservoir to become oxygen deficient or anaerobic. In anaerobic conditions, sulfide levels can sometimes be quite high. At times, the sulfide concentrations in the hypolimnion, or deepest layer of a lake or reservoir, can violate the current standards established to protect aquatic life designated uses. ADEQ clarified that the current sulfide standards apply only to water samples taken from the epilimnion, or the upper layer of a lake or reservoir.

The triennial review process

§ 303(c)(1) of the Clean Water Act requires that a state shall, from time to time, but at least once every three years, hold public hearings to review state-adopted water quality standards and, as appropriate, modify and adopt standards. The beginning of each triennial review cycle is measured from the date of the transmittal letter that ADEQ sends to EPA informing EPA that revised or new standards have been adopted and are being submitted to EPA for their review. Arizona's water quality standards rules were last revised on April 26, 1996.

ADEQ identifies new water quality standards or revisions that need to be made to existing water quality standards rules in each triennial review. Recommendations for changes to existing water quality standards or suggestions for adoption of new standards come from many sources, including ADEQ and EPA Region IX staff, water quality advisory groups, persons in the regulated community, and citizens who are interested in surface water quality issues.

Public participation

A required element of the triennial review process is public participation. The active and meaningful involvement of persons who are or may be affected by water quality standards decisions is critical to the successful implementation of ADEQ's water quality standards program. At a minimum, § 303(c) of the Clean Water Act requires that states hold one public hearing to review and discuss revisions to the water quality standards. In recent triennial reviews, ADEQ has gone far beyond the minimum public participation requirements prescribed in the Clean Water Act. ADEQ sponsored a variety of public participation activities. ADEQ has held public meetings, roundtable discussions, and met with advisory groups to discuss water quality standards issues and proposed revisions to the water quality standards rules.

Prior to the publication of the Notice of Proposed Rulemaking, ADEQ conducted a number of informal public participation activities to identify water quality standards issues, solicit comments and suggestions for additions or revisions to the current water quality standards rules, and to discuss proposed unique waters nominations. ADEQ discussed water quality standards issues at several monthly meetings of the Water Quality Policy Coordinating Committee, a water quality advisory group. In late January and early February, 1999, ADEQ held a series of 3 public meetings in Flagstaff, Phoenix, and Tucson to take informal public comments on water quality standards issues that should be considered in this triennial review. In 1999 and in 2000, ADEQ staff held a series of informal public meetings in Casabel, Flagstaff, Alpine, Phoenix, and Globe to solicit comments on nominations of surface waters for classification as unique waters.

ADEQ published a preliminary draft set of revisions to the surface water quality standards rules and conducted a series of public meetings to take public comments on surface water quality issues raised in the preliminary draft. ADEQ considered the comments that were made on the preliminary draft rules before preparing the Notice of Proposed Rulemaking.

The general framework for public participation in Arizona's triennial review process is notice and comment rulemaking. The publication of a Notice of Proposed Rulemaking on May 4, 2001 initiated the formal rulemaking process to revise the surface water quality standards rules. ADEQ held oral proceedings to take formal public comments on the proposed rules in June, 2001 in Phoenix, Tucson, Flagstaff, Globe, and Springerville. The public comment period closed on July 20, 2001.

ADEQ has considered all of the public comments received, made appropriate revisions to the proposed rules, and developed a formal responsiveness summary. ADEQ has 120 days from the close of the public comment period to either adopt revisions to the surface water quality standards rules or terminate the rulemaking. This Notice of Final Rulemaking includes the revised rules, an explanation of the changes to the rules, the agency responses to comments, and an economic impact statement. The Notice of Final Rulemaking is then submitted to the Governor's Regulatory Review Council [GRRC]. The GRRC reviews the agency's Notice of Final Rulemaking at a public meeting and either approves or disapproves the rules. If the rules are approved, they are filed with the Office of the Secretary of State and they become effective. The GRRC may disapprove the rules and return them to the agency for supplemental rulemaking activities.

EPA Review of State-Adopted Water Quality Standards

After final administrative action at the state level, ADEQ will submit the water quality standards revisions and an Attorney General certification that the revisions were duly adopted according to state law to EPA Region IX for review and approval or disapproval. 40 CFR § 131.20(c) of the federal water quality standards regulation requires ADEQ to submit the standards package to EPA within 30 days of final state action (that is, the date of filing with the

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Office of the Secretary of State). EPA reviews and either approves or disapproves the standards based on whether they meet the requirements of the Clean Water Act and the federal water quality standards regulations.

In general, three outcomes are possible: 1) EPA approval, in whole or in part, of the state's water quality standards, 2) EPA disapproval, in whole or in part, of the submitted standards, or 3) EPA conditional approval. EPA must, within 60 days of submittal by the state, notify ADEQ by letter of any approvals of the state's water quality standards. If EPA determines that the state-adopted water quality standards do not meet the requirements of the Clean Water Act, EPA Region IX must disapprove the standards within 90 days. A letter of disapproval must state why the standards do not meet the requirements of the Act and specify the revisions that must be made to obtain full EPA approval. State-adopted water quality standards do not become effective for Clean Water Act purposes until they are approved by EPA [*See Alaska Clean Water Alliance v. Clark*, No. C96-1762R (W.D. Wash. July 8, 1997)]

7. A reference to any study that the agency relied on in its evaluation of or justification for the rule, and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

None.

8. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

9. The summary of the economic, small business, and consumer impact:

ADEQ must prepare a summary of the economic, small business, and consumer impact because it is a required element of a Notice of Final Rulemaking [*See* R1-1-502]. ADEQ is required to prepare a final economic impact statement to accompany the final rules that ADEQ submits to the Governor's Regulatory Review Council.

ADEQ solicited comments on the economic impact of the rules from persons who will be directly affected by, bear the costs of, or directly benefit from proposed surface water quality standards rules. ADEQ stated that it was interested in receiving comments that relate to the following:

- a. The probable costs and benefits to ADEQ and other agencies that will be directly affected by the implementation and enforcement of the surface water quality standards rules.
- b. The probable costs and benefits to a political subdivision of Arizona that will be directly affected by the implementation and enforcement of the surface water quality standards rules.
- c. The probable costs and benefits to businesses directly affected by the proposed rulemaking, including any anticipated effects on revenues or payroll expenditures of employers who may be affected by the rules.
- d. The probable impacts on private and public employment.
- e. The probable impacts on small businesses, including probable compliance costs and whether there are any methods that ADEQ may use to reduce the impact on small businesses (for example, less costly compliance requirements, schedules of compliance, and exemptions).
- f. The probable effects on state revenues.
- g. The probable costs and benefits to private persons and consumers who are directly affected by the rulemaking.
- h. Descriptions of any less intrusive or less costly alternative methods of achieving the purpose of the proposed rulemaking.

ADEQ stated in the Notice of Proposed Rulemaking that it was particularly interested in obtaining public comments on the possible economic impact of the proposed adoption of numeric criteria to protect aquatic life from chronic toxicity of ammonia, the proposed repeal of the nutrient waiver provision, and the proposal of surface waters for unique waters classification. ADEQ received no public comments relating to the economic impact of the proposed standards.

In general, ADEQ does not believe that the revisions to the surface water quality standards rules will have an economic, small business, or consumer impact. Most of the proposed revisions to the water quality standards are editorial changes or clarifications of the current rules that have no economic impact.

The proposed revisions to the rules may affect political subdivisions of Arizona that operate wastewater treatment plants that discharge effluent to surface waters regulated by surface water quality standards. In particular, the adoption of numeric water quality criteria to control chronic ammonia toxicity in surface waters with the A&Wc and A&Ww designated uses may result in new water quality-based discharge limitations in NPDES permits for wastewater treatment plants that discharge to perennial streams with these designated uses. Wastewater treatment plants and other point source dischargers may be required to upgrade treatment to control ammonia toxicity in discharges to surface waters. ADEQ received no comments on the proposed ammonia criteria from wastewater treatment plant operators and has no data to predict the extent of the economic impact to political subdivisions from the proposed rule change (if any).

Similarly, the repeal of the nutrient waiver rule may affect a small number of wastewater treatment plant operators who currently operate wastewater treatment plants under nutrient waivers. Again, the proposed revision may require

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these wastewater treatment plants to upgrade wastewater treatment processes to control the discharge of nutrients to surface waters. If the nutrient waiver rule is repealed, ADEQ may establish schedules of compliance to provide time for the wastewater treatment plants to come into compliance with applicable nutrient standards. In the alternative, operators of the affected wastewater treatment plants may apply for a variance.

The proposed revisions to the surface water quality standards are expected to have no impact on private and public employment.

The proposal to classify nine surface waters as unique waters may affect some private persons (for example, ranchers who have grazing allotments in the watersheds where the proposed unique waters are located). In general, the proposed unique waters are located in remote areas of the state, in National Forests, or in wilderness areas. A unique waters classification may result in changes in forest management plans for the Apache Sitgreaves National Forest and could result in new requirements for best management practices to control nonpoint source discharges of pollutants. Unique waters classifications may affect the uses of public lands within the proposed unique waters watersheds such as grazing, timber harvesting, and mining activity. Again, ADEQ received no comments relating to the social or economic impact of the nine unique waters.

The proposed revisions to the surface water quality standards rules are anticipated to have little or no economic impact on other state agencies, with the exception of Arizona State Parks.

It is possible that the more stringent bacteria standard for *E. coli* may have an economic impact on the operations of the Arizona State Parks. ADEQ adopted a more stringent single sample maximum standard for *E. coli* in this triennial review that applies to surface waters with the full body contact recreation designated use. The adoption of a more stringent bacterial standard may affect State Park operations at Slide Rock State Park in Oak Creek Canyon near Sedona, Arizona. The principal attraction at Slide Rock State Park is a popular swimming area located in Oak Creek. Arizona State Parks conducts routine monitoring of the bacterial water quality of Oak Creek and closes the swimming area when bacterial water quality standards are exceeded. State Parks predicts that the more stringent bacterial standard may result in as many as 14 high risk swimming advisories and closures of the swimming area. Arizona State Parks estimates that each closure of the Slide Rock swimming area costs approximately \$1,150 per day or an estimated total of \$16,100 in lost revenues. In addition, each swimming advisory results in increased costs for Arizona State Parks staff associated with posting public notice and increased monitoring.

ADEQ will continue to incur the normal costs of managing the surface water quality standards program. The surface water quality standards program currently is implemented by three FTEs in the Hydrological Support & Assessment Section, Water Quality Division of ADEQ.

There are no fees associated with the rules and the rules are expected to have no effect on state revenues, except as noted in discussion on impacts on Arizona State Park revenues.

10. A description of the changes between the proposed rules, including supplemental notices, and final rules (if applicable):

ADEQ made the following changes between the proposed rules and the final rules:

1. ADEQ amended the proposed narrative standard in R18-11-108(A)(1) in the Notice of Proposed Rulemaking in response to comments. The proposed narrative standard stated: "A surface water shall be free from pollutants in amounts or combinations that are suspended in the water column and that impair a domestic water source use." ADEQ amended this narrative standard and moved it to R18-11-108(C) in the Notice of Final Rulemaking. The final rule states: "A discharge of suspended solids to a surface water shall not be in quantities or concentrations that either interfere with the treatment processes at the nearest downstream potable water treatment plant or substantially increase the cost of handling solids produced at the nearest downstream potable water treatment plant."
2. ADEQ repealed R18-11-109(I)(1) in the final rules. The proposed rules included water quality standards for radiochemicals in R18-11-109(I)(1). The proposed rule stated that the concentration of radiochemicals shall not exceed the limits established by the Arizona Radiation Regulatory Agency in 12 A.A.C. 1, Article 4, Appendix A, Table H, Column 2. The rule contained an incorporation by reference of the Table H that was effective June 30, 1977. The staff of the Governor's Regulatory Review Council advised ADEQ that the incorporation by reference was obsolete because the Arizona Radiation Regulatory Agency repealed the table in 1994. ADEQ repealed R18-11-109(I)(1) because the underlying radiochemical standards do not exist.
3. ADEQ amended R18-11-114(K), the mixing zone rule. In the Notice of Proposed Rulemaking, ADEQ proposed to prohibit mixing zones for a list of persistent, bioaccumulative pollutants. The list of pollutants included cadmium. In the Notice of Final Rulemaking, ADEQ deleted cadmium from the list because ADEQ did not include an adequate rationale explaining its inclusion.
4. ADEQ made minor revisions to the human health criteria prescribed in Appendix A, Table 1, Human Health and Agricultural Designated Use Numeric Water Quality Criteria.
5. ADEQ amended Appendix B, List of Surface Waters and Designated Uses in response to public comments.
6. ADEQ made grammatical, punctuation, and organizational changes recommended by the staff of the Governor's Regulatory Review Council.

11. A summary of the principal comments and the agency response to them:

R18-11-101. Definitions

1. *Comment:* We support the revision of the definition of “effluent-dependent water,” which helps to clarify that a surface water cannot be converted from the A&Wc or A&Ww designated use to A&Wedw without conducting a use attainability analysis to justify the change.

Response: The revised definition of “effluent-dependent water” is clearer and it more accurately describes the types of surface waters that are eligible for classification as effluent-dependent waters. One of ADEQ’s main reasons for adopting a revised definition of “effluent-dependent water” is to clarify that a perennial or intermittent surface water with an aquatic and wildlife (warm water) or aquatic and wildlife (cold water) designated use cannot be classified as an effluent-dependent water. A wastewater treatment plant that discharges treated wastewater to an intermittent or perennial water is required to meet the applicable water quality standards of the receiving surface water (that is, either A&Wc or A&Ww). ADEQ adopted the definition of “effluent-dependent water” as proposed.

2. *Comment:* The proposed definitions for A&W (edw) and A&W (e) do not adequately address how to characterize these types of designated stream reaches that, as a secondary or incidental use, accept man-made discharges such as those used to perform recharge or those found in projects such as the Rio Salado. The new definition of A&W (edw) is limited to those stream segments where, but for the addition of effluent, the stream segment would be classified as ephemeral water. The proposed definition of an A&W (edw) stream does not permit any water other than effluent to flow in the segment. Thus, any additional water introduced into an A&W (edw) stream segment; for example, flow from the Rio Salado Project or the recharge of CAP water, under the current definition could potentially cause the stream segment to be reclassified from an A&W (edw) to an A&W (w) classification.

Response: ADEQ disagrees. The revised definitions of “effluent-dependent water” and “ephemeral water” concisely and correctly define these types of surface waters. The definitions of “effluent-dependent water” and “ephemeral water” should not be based on secondary or incidental use considerations such as water transfers, recharge projects, or the Rio Salado Project. The commenter is concerned that the transfer of surface water through the CAP canal that results in flow in an ephemeral water or the discharge of pumped groundwater to an ephemeral water will preclude its classification as an EDW. The existence of such discharges would have to be evaluated on a case-by-case basis. If water transfers or the discharge of pumped groundwater transform an ephemeral water into an intermittent or perennial water, then the appropriate water quality standards to protect aquatic life are either A&Wc or A&Ww. However, if discharges are episodic, of short duration, and they do not change the ephemeral water into an intermittent water, then in ADEQ’s view, the existence of occasional discharges does not necessarily preclude an effluent-dependent water classification. Also, the discharge of CAP water or pumped groundwater into an EDW to improve water quality or for aesthetic purposes would not be prohibited by the revised definition nor would it result in the reclassification of an existing EDW.

ADEQ states in the preamble that the new definition of “effluent-dependent water” will not be given retroactive effect and it will have no effect on surface waters that are already classified as effluent-dependent waters. Existing EDWs will not be reclassified because of the revised definition of “effluent-dependent water.”

3. *Comment:* With the removal of the word, “primarily,” in the definition of “effluent-dependent water,” it appears that the rule would strictly define an effluent-dependent stream as one which flows only from effluent flow or in direct response to precipitation. The definition should be modified to allow periodic releases of other flows, such as the recharge of CAP water. If “primarily” were retained such periodic releases would still be appropriately classified as effluent-dependent. Without “primarily” the reach would [not?] meet the definition proposed.

Response: The new definition of “effluent-dependent water” is intended to define an effluent-dependent water as a surface water that consists of the discharge of treated wastewater or that contains storm water runoff that is a direct response to precipitation. ADEQ disagrees that the definition should be revised to specifically address water transfers, dam releases, in-stream recharge, or other types of discharges.

4. *Comment:* The proposed rule would delete the word, “primarily,” from the definition of EDW and add: “An effluent-dependent water is a surface water that, without the discharge of treated wastewater, would be an ephemeral water.” These changes would require that only waters composed entirely of effluent could be classified as EDWs. As the rule is written, any water that receives irrigation return flows, periodic releases from dams, or groundwater flows in any amount no matter how small cannot be classified as an EDW. The word, “primarily” should be retained. Although the term is imprecise, it still allows the rule to be implemented and reflects the realities of EDWs.

Response: ADEQ disagrees that the word, “primarily,” should be retained in the definition of “effluent-dependent water. The definition of “effluent-dependent water” is vague when “primarily” is retained in the definition. ADEQ does not agree that an ephemeral water that receives periodic irrigation return flows or occasionally has flows that are a result of the release of water from a dam is precluded from being considered for EDW classification. ADEQ does not interpret the revised definition of effluent-dependent water that narrowly. Episodic irrigation return flows to ephemeral waters and releases of water from dams may or may not change a surface water from an ephemeral water into an intermittent water. ADEQ will evaluate surface waters on a case-by-case basis at the time a request for EDW classification is made to determine whether the receiving surface water that is the subject of a request for EDW classification meets the definition of an ephemeral water or not.

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5. *Comment:* ADEQ should delete the second sentence from the proposed R18-11-101(21). As proposed, the rule would have two independent criteria to be an EDW: 1) an EDW is designated by rule based on the criteria in R18-11-113(C), and 2) an EDW is a water that would be an ephemeral water were it not for the presence of effluent. If the intent is to provide alternative criteria, the period at the end of the first sentence in R18-11-101(21) should be replaced by the word “or.” The paragraph makes no sense with two separate sentences because it is not clear which sentence controls.

Response: The revised definition of EDW does not provide alternative criteria for the classification of effluent-dependent waters. The second sentence in the definition which states that an “effluent-dependent water is a surface water that, without the discharge of treated wastewater, would be an ephemeral water” is not intended to be an alternative criterion. The second sentence is intended to clarify and further explain the first sentence of the definition. The new definition of “effluent-dependent water” has 2 main elements: 1) an EDW is a surface water that consists of discharges of treated wastewater, and 2) without the discharge of treated wastewater, the receiving surface water would be an ephemeral water. If these two elements are met, the Director may classify the surface water as an EDW by rule.

6. *Comment:* The addition of (C)(3) to R18-11-113 could have the effect of de-classifying some existing EDWs because their receiving streams do not meet the strict definition given for an ephemeral water. That is, they flow only in direct response to direct precipitation or the channel may not at all times be above the water table. This criterion should be revised to add the following after “wastewater”: irrigation return flow and releases from dams.

Response: The revised definition of “effluent-dependent water” will not have the effect of de-classifying existing EDWs. The revised definition of EDW will be given future effect from the effective date of the rule. It will have no effect on surface waters that are already classified as EDWs and listed in the rules.

7. *Comment:* I believe the proposed amendment to the definition of “effluent-dependent water” is a mistake. Requiring an effluent-dependent water to be solely effluent except in response to a precipitation event (in other words, ephemeral) is unrealistic. Water courses in Arizona dominated by effluent have water quality characteristics that cannot be compared to natural, perennial streams. Making this change could endanger designations where periodic irrigation return flow, canal leakage, or other water contributions to a water course that are not a direct result of precipitation occur. That just doesn’t make any sense. For instance, if one wanted to add water from the Central Arizona Project for aesthetic purposes to an otherwise effluent-only stream, that would not be possible without a change in designation. That change would prevent that aesthetic event from happening because nobody would want to create that water quality regulation change just for aesthetic purposes.

Response: The new definition of “effluent-dependent water” becomes relevant at the time a request for EDW classification is made to the Director. The change in the definition will neither “endanger” existing EDW classifications nor will it prevent the discharge of other sources of water to an EDW for aesthetic purposes. Episodic discharges of irrigation return flows or canal water to an ephemeral water would not preclude EDW classification if they are of short duration and they do not transform the ephemeral water into an intermittent stream.

8. *Comment:* The Pima County Wastewater Management Department is currently participating in other regulatory discussions concerning how to clarify whether a sewer system overflow goes to either waters of the United States, storm drains, or flows only onto upland terrain (that is, not in waters of the United States). The current definition of “ephemeral water” is unclear with regard to what the definition of “channel” is. It would be very helpful from a regulatory perspective if the water quality standards rules included a precise definition of the term “channel” due to its use within the definition of “ephemeral water.” We suggest that the following definition be used for the term “channel:” “A channel is a natural streambed or artificial conduit, such as a concrete-lined natural wash that drains an area greater than five acres to a region designated in these water quality standards. A channel is not a storm drain designated by a county or municipality with jurisdiction or ownership of a storm drain system.” The concept of using a five-acre watershed as a way to characterize significant surface runoff is codified in Arizona Administrative Code, Title 18, Chapter 9, Water Pollution Control. R18-9-312(C) describes setback requirements for conventional septic systems, from areas that drain more than five acres. The five-acre limit was incorporated into the rules after much stakeholder discussion as to what should be considered a significant drainage channel, in relation to water pollution control for regulatory purposes.

Response: ADEQ disagrees that the water quality standards rules should include a new definition of “channel,” particularly at this stage of the rulemaking. ADEQ agrees that a definition of “channel” may be helpful in making the definition of “ephemeral water” more understandable. However, ADEQ does not have a clear understanding of what the legal consequences of adopting the suggested definition of “channel” may be. Before ADEQ adds a definition of “channel” to the surface water quality standards rules to clarify the meaning of “ephemeral water,” ADEQ would like to have a broader public discussions of the possible impact that the suggested definition may have on the meaning of “ephemeral water” and the applicability of the surface water quality standards to “waters of the United States” in general. The suggested definition of “channel” may raise jurisdictional issues under the Clean Water Act that have not been fully explored. Also, ADEQ believes that adopting a new definition of “channel” at this stage of the rulemaking may result in a definition of “ephemeral water” that is substantially different from the definition contained in the Notice of Proposed Rulemaking. Under the State Administrative Procedures Act, ADEQ cannot adopt a definition of “channel” if it results in a rule that has a substantially different effect. ADEQ would have to terminate this rulemaking proceeding and commence a new rulemaking to adopt a definition of “channel” that has a substantially different effect. For this reason, ADEQ will defer consideration of this issue to a future triennial review.

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9. *Comment:* The Pima County Department of Environmental Quality has discussed how to precisely define “channel” when discussing the effects of a wash. It would be very helpful from a regulatory perspective, if the term, “channel,” used in the ephemeral stream definition, were precisely defined. Pima County DEQ suggests using the previously codified definition of wash found in R18-9-312(C) which describes setback systems for onsite disposal systems. The channel of a wash with a drainage area of five acres or more should be considered a “channel for the purposes of this rulemaking in order to remain consistent with previous definitions. ADEQ should be familiar with the rationale for using this guideline from the Aquifer Protection Permit rules.

Response: See response to previous comment.

10. *Comment:* The definition of “ephemeral water” should be expanded to include periodic man-made discharges other than effluent that may occur at a specified frequency but with the intent to create or sustain aquatic habitat. Without such flexibility, any such discharge would preclude the stream reach from being designated ephemeral.

Response: ADEQ disagrees. The definition of “ephemeral water” in the final rules is consistent with the generally accepted hydrologic definition of the term. The standard definitions of “ephemeral water” do not include references to periodic man-made discharges. No change to the rules.

11. *Comment:* We oppose the proposed amendment to the definition of “ephemeral water.” The phrase, “and that does not support a self-sustaining fish population,” should not be eliminated. Many ephemeral waters flow for long enough, particularly at higher elevations or during the summer months, that a self-sustaining fish population may exist. Because ADEQ regulates ephemeral waters differently than perennial waters, it is necessary that ADEQ evaluate whether a fish population exists in an ephemeral water before subjecting that water to less stringent water quality standards. The current definition of “ephemeral water” is consistent with the fundamental goals of the Clean Water Act which provide for the protection and propagation of fish, shellfish, and wildlife.

Response: ADEQ disagrees. The generally accepted hydrologic definition of “ephemeral water” does not include a reference to the support of self-sustaining fish populations. The definition of “ephemeral water” in the final rule is the more correct hydrologic definition of the term. Moreover, ADEQ disagrees with the comment that ephemeral waters may flow for a long enough period of time to support a self-sustaining fish population. By definition, ephemeral waters are surface waters that have channels that are at all times above the water table and that flow only in direct response to precipitation. This means that there is no connection between the channel of an ephemeral water and groundwater. As defined, it is impossible for an ephemeral water to have base flow that would support a fish population. Ephemeral waters flow only for very short periods of time in direct response to storm events. By contrast, a surface water that flows continuously for 30 days or more at times of the year when it receives water from springs or from some other source of water such as melting snow is considered to be an intermittent surface water [See the definition of “intermittent water” at R18-11-101(30)]. ADEQ recognizes that intermittent surface waters may flow for long enough periods of time to support aquatic life, including fish, at certain times of the year. For this reason, intermittent waters are protected by the same types of aquatic life standards as perennial waters. Intermittent waters have either an A&Wc or A&Ww designated use.

12. *Comment:* Should ADEQ adjust the definition of “surface water” so that it is not tied to “waters of the United States” because of the recent federal court ruling that intermittent waters are not “waters of the United States” or is the current definition secure as it stands?

Response: No. ADEQ should not adjust the definition of “surface water” or sever its link to “waters of the United States.” ADEQ is required by state law to adopt water quality standards for “navigable waters.” “Navigable waters” are defined in the Clean Water Act as the “waters of the United States.” ADEQ has consistently stated its position that “surface water,” “navigable water,” and “waters of the United States” are synonymous terms when used in the surface water quality standards rules. No change to the definition.

13. *Comment:* Arizona’s definition of “surface water” must account for the fact that the Colorado River flows to the sea. While we recognize that ADEQ is not proposing to change this rule in this triennial review, it is imperative that ADEQ recognize this sea connection and the probability that pollutants discharged into the Colorado River will reach an ocean.

Response: ADEQ disagrees that the definition of “surface water” must somehow recognize or account for the fact that the Colorado River flows to the sea. While the federal definition of “waters of the United States” contains references to the territorial sea and to waters that are subject to the ebb and flow of the tide, these references are not relevant in Arizona and they do not need to be included in the definition of “surface water.” No change to the definition.

14. *Comment:* The Arizona Mining Association (AMA) supports ADEQ’s proposed revisions to the definition of “ephemeral water.” As ADEQ explains in the preamble to the proposed rules, the biological element in the current definition that refers to the non-support of a self-sustaining fish population is inconsistent with generally accepted hydrological definitions of “ephemeral water” and clearly should be removed.

Response: ADEQ agrees. The definition of “ephemeral water” in the final rules is consistent with the generally accepted hydrologic definition of “ephemeral water.” The definition of “ephemeral water” in the final rule does not include a biological element and it does not include any reference to the support of self-sustaining fish populations.

15. *Comment:* The Arizona Mining Association (AMA) supports changing the definition of “existing use” at R18-11-101(23) to include a use that actually occurs in place of a use that actually occurred on or after November 28, 1975. However, the AMA respectfully requests that ADEQ delete the phrase “or a use that the existing water quality of a surface water will allow” from the definition of “existing use” because the phrase inappropriately suggests that uses are established based not only on what is actually occurring in a surface water but also on a subjective determination of what potential uses could occur. This phrase also is inconsistent with the federal definition of existing uses found in the federal water quality standards rule at 40 CFR § 131.3(e).

Response: ADEQ agrees that the reference to “November 28, 1975” should be deleted from the definition of “existing use” and the final rule reflects this. However, ADEQ disagrees that the phrase which states “or a use that the existing water quality of a surface water will allow” should be deleted from the definition of “existing use.” The latter reference to existing water quality in the definition of “existing use” is based on EPA guidance interpreting the meaning of “existing use” that can be found in § 4.4 of the Water Quality Standards Handbook, Second Edition. EPA guidance states that an existing use may be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975 or that the water quality is suitable to allow a use to be attained (unless there are physical problems, such as substrate or flow, that prevent the use from being attained). It is clear from the EPA guidance that the meaning of “existing use” is not limited to the actually occurring uses of a surface water. ADEQ agrees with EPA that existing water quality sufficient to support a use is another way to demonstrate an “existing use.” ADEQ will retain the phrase which establishes this ground for establishing an existing use in the definition in the final rule.

16. *Comment:* 40 CFR § 131.3 states that “existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are *being attained* [sic] (Note: The cited federal regulation actually states: “...whether or not they are included in the water quality standards.”) 40 CFR § 131.10 (h) states that a state may not remove a designated use which is an existing use (that is., remove a use attained on or after November 28, 1975 whether or not it is presently being attained) unless a more stringent use is added. [See 40 CFR § 131.10(h)(1)]. EPA’s position regarding the breadth of the definition of “existing uses” and the need to protect uses attained after November 28, 1975 is further described at EPA, Advanced Notice of Proposed Rulemaking, Water Quality Standards Regulation, 63 Federal Register 36742, 36751-53 (July 7, 1998) (“... the current regulation ensures that the better of the past or present condition, at a minimum, will be maintained and protected.”). EPA’s current interpretation is that the existing use should be identified either where the use has taken place or the water quality sufficient to support the use has existed since November 28, 1975, or both.”). The ADEQ proposal would revise the state’s definition of “existing use.” Pursuant to the revision, a use that had actually been attained on or after 1975 would no longer be a sufficient basis to consider it an existing use. As a result, R18-11-104(H) would allow the removal of uses which have been attained, under circumstances prohibited by 40 CFR § 131.10. In addition, the protection afforded waters under R18-11-107(B) would no longer meet the requirements of 40 CFR § 131.12.

Response: ADEQ disagrees. The definition of “existing use” should be revised to delete references to uses that are attained *on or after November 28, 1975*. The current definition of “existing use” is “a use that has actually occurred in a surface water on or after November 28, 1975 or a use that the existing water quality of a surface water will allow.” The current federal definition of “existing use” includes a citation to November 28, 1975 which ADEQ understands is the date of EPA’s promulgation of the federal water quality standards regulation in 40 CFR, Part 131. ADEQ repealed the reference to “on or after November 28, 1975” in the definition in the state-adopted surface water quality standards rules because ADEQ does not have reliable information on the historic and actual uses of surface waters as of a specific date more than 25 years ago. In ADEQ’s view, there is no utility to linking the state’s definition of “existing use” to the date of the federal promulgation of the water quality standards regulation. The revised definition, without reference to November 28, 1975, is clearer, more concise, easier to understand, and it is more practicably implemented. ADEQ recognizes that the definition of “existing use” in the final rule does not repeat the federal definition of “existing use” verbatim. However, ADEQ does not think that the proposed deletion of the date will have any real or practical effect on the actual implementation of the surface water quality standards rules, including the removal of designated uses through the use attainability process. In the absence of historical records or information on the actual or historic uses of surface waters that have occurred since November 28, 1975, the deletion of the date has no practical effect.

17. *Comment:* For the most part, the changes in definitions are beneficial. However, the proposal would provide that an “existing use” is “a use that the existing water quality of a surface water will allow.” This definition is too broad and it will create problems in canals. The rule stretches the concept of an “existing use” beyond the terms of the Clean Water Act and the applicable state statutes. A.R.S. § 49-221(A) makes reference to protecting “reasonably foreseeable future uses” and A.R.S. § 49-221(C)(2) makes references to uses which “with reasonable probability may be made.” Neither of these subsections references “a use that the existing water quality of the surface water will allow.” Therefore, even if the water quality is sufficient to support a use, that use shall not be designated unless there is a reasonable probability that the use will be made. For example, a water that meets the full-body contact recreation (FBC) water quality standards should not be designated FBC if for some reason FBC activities are not likely occur in the water. The water may not be accessible, it may have physical hazards that prevent FBC activity, or it may too shallow to accommodate FBC activities. The City recommends changing the last clause of the definition so it reads: “Existing use means a use that actually occurs in surface water or a use that is reasonably foreseeable.”

Response: ADEQ did not “stretch” the definition of “existing use” beyond the Clean Water Act or the relevant state statutes. First, neither the Clean Water Act nor the state Water Quality Control statutes define “existing use.” Second, there is a definition of “existing use” in the federal water quality standards regulations [See 40 CFR § 131.3]. EPA defines “existing uses” as those uses *actually attained* in the water body on or after November 28, 1975, whether or not they are included in the water quality standards. EPA provides its interpretation of what is meant by the phrase, “actually attained,” in the Water Quality Standards Handbook, Second Edition. ADEQ thinks that almost everyone would generally agree that the phrases, “existing uses” and “actually attained” includes those uses that occur in a surface water. However, EPA guidance on the meaning of “existing use” indicates that the term is not strictly limited to those uses that occur. EPA guidance states that an “existing use” can be established by demonstrating that uses have actually occurred or *that the water quality is suitable to allow the use to be attained*. For example, there may be surface water where fish are propagating and surviving in a biologically suitable habitat and they are available and suitable for harvesting but no one has attempted to harvest them. Such facts clearly establish that fish consumption is an “existing use” and not one that is dependent upon improvements in water quality. To argue otherwise would be to say that the only time a fish consumption use exists is when it demonstrated that someone actually catches a fish from a surface water and eats it. The commenter is correct that the state statutes require ADEQ to establish water quality standards to preserve and protect water quality for all present and reasonably foreseeable future uses [See § 49-221(A)]. However, this statute is relevant to the establishment of designated uses for surface waters and it does not relate to the definition of “existing use.” No change to the definition.

18. *Comment:* In order to avoid the application of the definition of “intermittent water” to an ephemeral water that may flow for longer than 30 days during a particular year due to a heavier than normal precipitation pattern, ADEQ should clarify that this definition applies only to water segments that flow for more than 30 days every year on a consistent basis. The revised definition of intermittent water appears to require 30-day annual flows on a year-to-year basis but ADEQ’s intent should be memorialized in the rule preamble.

Response: ADEQ disagrees. While ADEQ intends to include surface waters that flow for more than 30 days within the definition of “intermittent water,” ADEQ does not intend to limit the definition of intermittent water by requiring that a surface water flow for a minimum of 30-days *every year*. ADEQ agrees with the commenter that, in most cases, intermittent waters will flow on a consistent year-to-year basis. For example, many intermittent surface waters are located at higher elevations in the state where they predictably flow for 30 days or more each year during spring run-off periods when melting snow or springs provide a source of water. However, there may also be intermittent surface waters that flow in wet years and that do not flow in drought periods. No change to the definition.

19. *Comment:* While the inclusion of a definition of “pollutant” in the water quality standards may be desirable, the Arizona Mining Association (AMA) does not support the proposal to adopt the definition of “pollutant” from A.R.S. § 49-201(28). Rather, AMA believes that ADEQ should use the definition of “pollutant” from § 402(6) of the Clean Water Act. The definition of “pollutant” in A.R.S. § 49-201(28) is overly broad and includes language not included in the federal definition. Moreover, the definition in A.R.S. § 49-201(28) seems more specifically designed for the Aquifer Protection Permit program rather than the setting of water quality standards pursuant to the Clean Water Act. ADEQ also has proposed to use the federal definition of “pollutant” in its pending AZPDES permit and impaired water identification rule packages. The same definition of “pollutant,” (i.e., the federal Clean Water Act definition) should be used for all of these rules.

Response: ADEQ disagrees that it should use the definition of “pollutant” from the Clean Water Act in the surface water quality standards rules instead of the statutory definition of “pollutant” in the Arizona Revised Statutes. The statutory definition of “pollutant” at A.R.S. § 49-201(28) is found in the Water Quality Control statutes. These statutes include the authorizing statutes for the surface water quality standards program. The specific statute that addresses water quality standards for navigable waters,

A.R.S. § 49-201, uses the term, “pollutants” as that term is defined by A.R.S. § 49-201(28). There is nothing in the statutory definition of “pollutant” to indicate that its applicability is limited to the Aquifer Protection Program. ADEQ believes that it should be consistent with the definition of “pollutant” as that term is used in its authorizing statutes. No change to the definition.

20. *Comment:* The recent U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (“SWANCC”) arguably precludes federal CWA jurisdiction over isolated, non-navigable waters on any grounds, including any of the specific examples listed in paragraph (c) of the regulatory definition of “surface water” in R18-11-101(43). As summarized by Justice Stevens, the Supreme Court’s holding in *SWANCC* “invalidate[d] the 1986 migratory bird regulation as well as the Corps’ assertion of jurisdiction over all waters except for actually navigable waters, their tributaries, and wetlands adjacent to each.” The *SWANCC* opinion arguably forecloses CWA jurisdiction not only over isolated waters but also as applied to ephemeral waters. Accordingly, because of the *SWANCC* decision, ADEQ should at the very least remove the extra examples of intrastate waters (e.g. ephemeral waters, reservoirs, creeks, washes, draws, and backwaters) from the regulatory definition of “surface water” in paragraph (c) of R18-11-101.43 that do not appear in the federal definition of “waters of the United States” at 40 CFR § 122.2. ADEQ should ensure that its definition of “surface water” closely tracks the federal definition because of the recent court developments limiting the potential application of Arizona’s water quality standards to isolated and ephemeral waters.

Response: ADEQ disagrees that the holding in the SWANNC decision justifies the removal of ephemeral waters, reservoirs, creeks, washes, draws, and backwaters from the state's definition of "surface water." It is more appropriate to address Clean Water Act jurisdictional issues on a case-by-case basis and argue the relevant case law in the courts when disagreements arise over whether a specific surface water is a "water of the United States" that is subject to regulation under the Clean Water Act. No change to the definition.

21. *Comment:* The City recommends adding the phrase "and is not an EDW" to the end of the definition of "perennial water." EDWs can flow continuously throughout the year but for purposes of the rule they should be distinguished from other perennial waters.

Response: ADEQ disagrees. The definition of "perennial water" is consistent with the standard hydrologic definition of the term. Moreover, ADEQ does not believe that it is necessary to distinguish EDWs from other perennial waters in the definition section. It is unnecessary to distinguish EDWs because the term, "perennial water," is used only in R18-11-105, the tributary rule. The basic purpose of the tributary rule is to establish water quality standards for surface waters that are not specifically listed in the surface water quality standards rules. As ADEQ points out in the preamble, the tributary rule does not apply to EDWs because all EDWs are classified by rule and specifically listed in the rules with their designated uses. No change to the rule.

22. *Comment:* ADEQ is proposing to define "intermittent surface water" as surface water that flows continuously for 30 days or more when it receives water from springs or from a surface water source such as melting snow. Intermittent surface water has the same aquatic life designated uses as perennial water. Does an intermittent surface water have to flow 30 continuous days every year or will it lose its designation in drought years? Will ADEQ evaluate waters that are currently EDWs to ensure that they do not meet the intermittent surface water definition? If EDW water meets the intermittent surface water condition will the EDW designation be removed? We recommend that the relationship between listed EDW and intermittent water be clarified.

Response: A surface water does not have to flow continuously at least 30 days every year to be considered an intermittent water. As pointed out in a response to a previous comment, ADEQ recognizes that there may be intermittent waters that do not flow in drought years. While the proposed definition creates some ambiguity regarding the distinction between ephemeral waters vs. intermittent waters, ADEQ believes that the definition of intermittent water is workable for purposes of the tributary rule. Questions over the appropriate identification of specific surface waters as ephemeral waters or intermittent waters and the proper application of the tributary rule can be addressed on a case-by-case basis. As noted previously, the terms, "intermittent water" and "perennial water," are used in the context of the tributary rule [See R18-11-105]. The terms are not relevant to existing EDW classifications. ADEQ will not evaluate existing EDWs to determine whether they are perennial or intermittent and no EDW will be reclassified because it is a perennial or intermittent water. No existing EDW designations will be removed. The classification of a surface water as an ephemeral water or an intermittent water is only relevant to future requests for EDW classification. If a receiving surface water is determined to be an intermittent water, then a request for EDW classification will be denied. A wastewater treatment plant that discharges to an intermittent surface water is required to meet the applicable aquatic life standards of the receiving surface water. If the receiving water is an intermittent water, the wastewater treatment plant would be required to meet the applicable A&Wc or A&Ww water quality standards.

23. *Comment:* The proposed definition of "pollutant" is not a definition, it is a list of materials that could be considered a pollutant. ADEQ states that the inclusion of rock, sand, and dirt in the statutory definition of pollutant is important because it clarifies that sediment in surface water is a pollutant. Sediment is clearly not a pollutant unless it is from an anthropogenic source. The definition needs clarification. To be classified as a pollutant, the substance must produce or cause a problem and be associated with human activities.

Response: The definition of "pollutant" in the surface water quality standards rules is a restatement of the statutory definition of "pollutant" at A.R.S. § 49-201(28). ADEQ disagrees with the comment that "pollutant" must be defined as having an anthropogenic source, must produce or cause a problem, or be associated with human activities to be considered a "pollutant." There can be natural sources of pollutants in surface waters. No change to the definition.

24. *Comment:* The definition of "surface water" refers to "waters of the United States." That is not a defined term in either these rules or in A.R.S. § 49-201. In order to be consistent with the Clean Water Act, the definition should refer to "navigable waters" which is defined at A.R.S. § 49-201(21) rather than "waters of the United States," or should include a citation to 33 U.S.C. 1362(7) after the reference to "waters of the United States." Either change would ensure that the scope of the state and federal definitions were the same which we have always understood to be ADEQ's intent.

Response: ADEQ disagrees that the definition of "surface water" should include a specific reference to "navigable water." ADEQ addressed this issue in previous triennial reviews of surface water quality standards. While the commenter is correct that both the Clean Water Act and the Arizona Revised Statutes refer to "navigable waters," ADEQ intends to use the term, "surface water," in the state rules. ADEQ used "surface water" to avoid confusion over the literal and commonly-accepted definitions of "navigable water." ADEQ thinks that many people who read the term, "navigable water," are not aware of the legal definition of the term in the Clean Water Act. Most people understand "navigable water" by its literal terms. That is, a literal interpretation of the meaning of "navigable water" is a water body that can be navigated in a boat or vessel of some kind. This understanding is reinforced by the use of "navigable water" in other legal contexts such as proceedings to adjudicate legal title to stream beds. To avoid confusion, ADEQ

uses the term, “surface water,” in the rules. ADEQ was careful to specifically define “surface water” in the rules in a way that makes clear that the meaning of “surface water” is the same as the meaning of “navigable water” and “water of the United States.” Also, ADEQ has stated in previous triennial reviews that “surface water” has the same meaning as “navigable water” and “water of the United States.” ADEQ thinks that the scope of the surface water quality standards is reasonably clear. The scope of the surface water quality standards rules is stated in the applicability section and is fully explained in the preamble. No change to the rules.

25. *Comment:* The definitions of the various classes of waters should refer to surface waters or portions thereof to reflect the fact that flow regimes in a single surface water may vary over the length of the water. This is clearly apparent in Appendix B, where numerous surface waters are classified as (for example) ephemeral for portions of their length and as perennial in other portions. The fact should be recognized in appropriate definitions.

Response: ADEQ agrees with the commenter that flow regimes in a surface water may vary over the length of the surface water. However, ADEQ does not believe that this fact needs to be recognized in the definition section. The fact that different reaches of a surface water may be perennial, intermittent, or ephemeral is appropriately recognized in Appendix B. Appendix B lists specific surface waters with their designated uses. Appendix B includes surface waters that have been segmented into different reaches with their appropriate designated uses.

R18-11-102. Applicability

26. *Comment:* We appreciate and support the ADEQ decision to eliminate the language regarding exclusion of mining impoundments from the surface water quality standards. That section created ambiguity and was a huge loophole for mining interests. The mines have too many exceptions in the law and the rules already.

Response: ADEQ did not repeal language relating to the mining impoundments exclusion in this triennial review. While ADEQ considered making clarifying changes to the mining impoundments exclusion in preliminary drafts of the surface water quality standards rules, ADEQ did not actually propose changes to the mining impoundments exclusion in the Notice of Proposed Rulemaking. Possible changes to the language of the mining impoundments exclusion that were considered by ADEQ in the preliminary draft were criticized by many stakeholders, including environmentalists, the mining industry, and representatives of the U.S. Environmental Protection Agency. Because ADEQ could not reach consensus or agreement on clarifying language, ADEQ decided to retain the current mining impoundments exclusion without change in this triennial review.

27. *Comment:* ADEQ specifically chose not to address the critical issue of the application of surface water quality standards to storm water discharges in this triennial review. As ADEQ is aware, the criteria supporting the current water quality standards do not account for the unique conditions that are created by episodic storm water discharges into ephemeral or other drainages. These unique conditions require that separate and appropriate standards be developed for storm water runoff. ADEQ should recognize these limitations in the final preamble for this triennial review package and also should initiate a review outside of the triennial review process of what surface water quality standards should apply in a storm event. This review should include an analysis of the current ephemeral water quality standards and the need for more specificity in defining the application of such standards to ephemeral waters. For example, the standards should identify when the standards apply in an ephemeral water (first flush vs. standing water) to be truly representative in light of the highly complex and unique nature of ephemeral waters.

Response: ADEQ acknowledges that, in general, the current surface water quality standards are not specifically designed to address wet weather flows or storm water discharges. A few provisions of the current standards rules have been revised to address storm water discharges. ADEQ has taken a number of regulatory actions to address some of the unique water quality standards issues presented by storm water flows and ephemeral waters, including the authorization of schedules of compliance for storm water discharges and the endorsement of a best management practices approach to controlling storm water discharges of pollutants to surface waters. ADEQ established a specific aquatic life subcategory for ephemeral waters and has attempted to establish appropriate and more tailored water quality criteria for ephemeral waters. For example, ADEQ does not apply water quality standards for turbidity in ephemeral waters. In this triennial review, ADEQ proposed the repeal of chronic aquatic life criteria for ephemeral waters. ADEQ also revised the temperature standards to clarify that the limit on the maximum increase in temperature from thermal discharges does not apply to storm water discharges.

ADEQ agrees that the applicability of surface water quality standards to storm water discharges is an important problem that should be addressed through a stakeholder process. However, ADEQ does not have sufficient data to establish “wet weather” standards in this triennial review. Moreover, ADEQ cannot adopt additional rules that would further define the applicability of water quality standards to storm water discharges (for example, “first flush” standards) in a Notice of Final Rulemaking when the subject was not addressed in the proposed rules. To do so would constitute a substantial change from the proposed rules. ADEQ is prohibited from submitting a rule to the Governor’s Regulatory Review Council that is substantially different from the proposed rule contained in the Notice of Proposed Rulemaking. No change to the rules.

28. *Comment:* The U.S. Fish and Wildlife Service is concerned about the applicability of surface water quality standards to wastewater retention ponds and to mining surface impoundments. The mining impoundment exclusion is likely to continue to cause adverse effects to wildlife. Although no known listed species have been affected by this exclusion, the attractive nuisance that these low pH or metal-laden waters present has caused significant wildlife mortalities in the last year which violates the Migratory Bird Treaty Act.

Response: The wastewater treatment system and the mining impoundment exclusions in R18-11-102 are existing surface water quality standards rules that have been approved by EPA Region IX. Both exclusions previously have undergone § 7 consultation under the Endangered Species Act. The source of the state's current waste treatment system exclusion in the surface water quality standard rules is a provision in the federal definition of "water of United States." 40 CFR § 122.2 provides, in relevant part:

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR § 423.11(m) which also meet the criteria of this definition are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as a disposal area in wetlands) nor resulted from the impoundment of waters of the United States (See Note 1 of this Section)

Under this paragraph, a treatment pond or lagoon that is part of a wastewater treatment system and which is located outside of what would otherwise be considered a "water of the United States" is *not* a water of the United States and surface water quality standards do not apply. This exclusion has been included in EPA's definition of "waters of the United States" and implemented by the National Pollutant Discharge Elimination Permit system for years.

The mining impoundments exclusion in R18-11-102 is similar. ADEQ established the mining impoundments exclusion in 1992. The original mining impoundments exclusion was disapproved by EPA Region IX because EPA thought it created ambiguity regarding where surface water quality standards applied. EPA was concerned that the mining impoundments exclusion did not satisfy the requirements for designation of uses for all navigable waters. EPA stated in its disapproval letter that in order for the state water quality standards to be approved, the state must either delete the mining impoundments exclusion *or revise it to ensure that those mining impoundments which are "waters of the United States" are governed by appropriate water quality standards.* In 1996, ADEQ revised the language of the mining impoundments exclusion to exempt from water quality standards only those mining-related impoundments that are either: 1) not a surface water, or 2) that are located in an area that may have been a surface water at one time but which has been legally converted to a water body that is not subject to Clean Water Act jurisdiction. The language of the revised mining impoundments exclusion states that only those mining impoundments that are not "waters of the United States" are excluded. The language of the mining impoundments exclusion was approved by EPA.

ADEQ did not propose revisions to the current mining impoundments exclusion in this triennial review. ADEQ continues to believe that it is unreasonable to apply surface water quality standards to the types of mining-related impoundments listed in the rule and regulate them under the surface water quality standards program. ADEQ shares the U.S. Fish and Wildlife Service's concerns regarding possible adverse affects on wildlife from exposure to toxic pollutants in mining impoundments. We are sensitive to the problem of industrial impoundments creating attractive nuisances for migratory waterfowl in our arid environment. However, these concerns do not justify the establishment of surface water quality standards for water bodies that were never intended to be regulated under the Clean Water Act. No change to the rules.

R18-11-104. Designated Uses

29. *Comment:* While we support ADEQ's attempt to better define A&Wc and A&Ww, we remain concerned about using the 5000 ft. elevation as an absolute cutoff to distinguish these uses. Instead, we believe that ADEQ should look to other factors such as whether or not there is significant shading of a particular stream, look at water temperatures, and consider whether or not there is a cold water macroinvertebrate community present. Under certain conditions, a lower elevation stream may support a cold water aquatic community. For example, our members have noted the presence of trout in Spring Creek, a tributary of Tonto Creek, at an elevation of 4200 feet. A warm water designation for this creek and others like it would be inappropriate. For these reasons, we believe that there should be some greater flexibility in the definitions. We do think it is appropriate for ADEQ to look at more than just the presence of salmonids when determining these designations.

Response: Many factors were taken into consideration before ADEQ decided to use the 5000 foot elevation contour as a predictive model for aquatic life use designation. The decision to use the 5000 foot elevation contour is based on data on the distribution of benthic macroinvertebrates in surface waters that ADEQ acquired through its biocriteria program research [See Spindler, Patti, "Macroinvertebrate Community Distribution Among Reference Sites in Arizona," Arizona Department of Environmental Quality, October, 2000]. ADEQ obtained macroinvertebrate data from 89 reference sites located throughout the state. Community patterns among the 89 reference sites were classified using 3 different multi-variate statistical methods. Statistical analyses of the data resulted in the identification of two broad macroinvertebrate community types in Arizona: cold water and warm water macroinvertebrate communities. Multiple regression analyses were performed on 14 landscape, habitat, and water quality variables to identify the environmental variables that best discriminated the community types. Many variables, such as temperature, alkalinity, riparian community type, and in-stream habitat variables were strongly correlated with elevation. To simplify statistical analyses, these and other auto-correlated variables were removed from the multiple regression analysis, leaving 14 environmental variables to represent water quality, habitat, and landscape conditions. Multiple regression analysis determined that elevation was the most significant environmental variable explaining the distribution of the two community types. This finding led to ADEQ's conclusion that the 5000 foot elevation contour could be used as a predictive model to determine whether an A&Wc or A&Ww designated use should apply to a surface water. ADEQ believes that the use of macroinvertebrate community types and the 5000 foot elevation contour is more reliable and a more scientifically defensible way to determine which aquatic life designated use applies to a surface water. ADEQ

recognizes that there may be exceptions to the use of the 5000 foot elevation contour to assign A&Wc and A&Ww designated uses. For example, there may be streams located below 5000 feet that are affected by hypolimnetic releases of very cold water from dams (for example, the Colorado River below Glen Canyon Dam). There may be streams located above 5000 feet that are influenced by hot springs. However, the use of the 5000 foot elevation contour as a general decision principle to guide the establishment of aquatic life designated uses is preferable to using the presence or absence of salmonids in streams. As with all general decision principles, ADEQ recognizes there will be exceptions to the general rule. For this reason, the definitions of both the A&Wc and A&Ww designated uses use the phrase, “generally occurring” above or below 5000 feet. The use of “generally occurring” provides flexibility. Exceptions and site-specific factors can be evaluated on a case-by-case basis if the application of the general decision principle results in the establishment of an inappropriate aquatic life use designation for a specific surface water. The key evaluation criterion is the type of macroinvertebrate community the surface water supports. No change to the rule.

30. *Comment:* To simplify the standards and to promote better understanding of the rule and better water quality overall, we suggest designating all of Arizona’s surface water for full-body contact recreation use and to just eliminate the partial-body contact designated use and standards, unless it is clear that children do not have access to the area. There is almost no difference between partial-body contact and full-body contact when it comes to children, we think the most protective standards possible should apply to all of these surface waters in order to adequately protect the health of young children. It is not only possible that an individual may incidentally ingest some amount of water when he or she swims in surface water; it is likely, especially if that person is a young child. We would like to see ADEQ build in some kind of safety factor in determining these limits and would rather see it default to more protective standards.

Response: The state has recognized a distinction between the water quality standards for primary recreation (that is, full-body contact recreation or FBC) and secondary recreation (partial-body contact recreation or PBC) since the first adoption of water quality standards for streams in Arizona in 1968. ADEQ agrees with the commenter that a single recreation use would simplify the surface water quality standards rules. ADEQ also agrees that with the adoption of revised *E. coli* criteria and a revised methodology to derive water quality criteria for the PBC designated use in this triennial review, there are only a few differences in the water quality criteria that have been established for the FBC and PBC designated uses. The lack of significant difference between the water quality standards for the FBC and PBC designated uses lends support to the argument that the two designated uses should be combined. However, the elimination of the partial-body contact recreation designated use would be a significant change from the proposed rules that cannot be made at this stage of the rulemaking. To make such a change, ADEQ would have to terminate this rulemaking and re-propose the surface water quality standards rules. The suggestion to combine the two designated uses into a single recreational use has merit and should be given serious consideration. However, ADEQ believes that consideration of this issue should be deferred to the next triennial review of water quality standards. In the meantime, ADEQ believes that the water quality criteria for the partial-body contact recreation use (which are essentially the same as the criteria for full-body contact recreation) are adequately protective of persons who may engage in partial-body contact recreation activities, including children.

31. *Comment:* ADEQ is proposing to revise the definitions of “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water)” to incorporate a reference to elevations of less than or greater than 5000 feet in order to focus on whether a particular perennial or intermittent stream supports either a cold water or warm water macroinvertebrate community, regardless of the presence of fish. Based on this approach, ADEQ is proposing to re-designate a number of surface waters from A&Ww to A&Wc. For example, ADEQ is proposing in Appendix B to separate Boulder Creek (located in the Bill Williams basin) which currently is designated as A&Ww for the entire stretch, into two segments, with the upper segment from the headwaters to the confluence with an unnamed tributary designated with A&Wc and the lower segment designated with A&Ww. Presumably this change is based on the fact that part of Boulder Creek is above the 5000 foot contour and the remaining segment is below the 5000 foot elevation contour. It appears that ADEQ is taking this approach with a substantial number of other water bodies. While the AMA does not necessarily object to the proposed changes to the definitions of the A&Wc and A&Ww uses, we question the validity of ADEQ’s automatic application of the revised definitions based on whether a stream segment is above or below the 5000 foot elevation contour. For instance, it does not appear that ADEQ has performed any independent analyses of whether the water segments that it is proposing to re-designate into A&Ww and A&Wc or vice versa actually support cold water or warm water macroinvertebrate communities. Without such a determination, any re-designations based on a 5000 foot elevation contour arguably would be inappropriate because they could result in the imposition of inaccurate designated uses. Moreover, the key criteria under ADEQ’s revised definitions of A&Ww and A&Wc is whether the surface water is being used by cold water organisms or warm water organisms. The use of the 5000 foot contour as a default factor to distinguish between the A&Wc and A&Ww designated uses ignores the key criteria of use by cold or warm water organisms. The proposed revised definitions also specifically recognize that cold water communities are *generally* found above 5000 feet and that warm water communities are *generally* found below 5000 feet. Consequently, the revised definitions recognize that there may be exceptions to the 5000 foot elevation assumptions. ADEQ specifically notes this possibility in the rule preamble. For all of these reasons, ADEQ should not move forward with its proposed Appendix B re-designations of water segments based on the proposed revisions to the definitions of A&Wc and A&Ww unless such re-designations are based on actual findings that a particular re-designated water segment actually supports either warm water or cold water macroinvertebrate communities.

Response: For the reasons stated in the preamble and in previous responses to other comments, ADEQ believes that the use of the 5000 foot elevation contour to establish the A&Wc and A&Ww designated uses is a valid and scientific

ically defensible approach to use designation. The approach is supported by empirical data on benthic macroinvertebrate communities obtained in Arizona. The use of the 5000 foot elevation contour is further supported by the results of multivariate statistical analyses that identified elevation as the most important environmental variable explaining the distribution of cold and warm water macroinvertebrate communities. ADEQ agrees with the commenter that the key criterion to support an aquatic life use designation for a specific surface water is whether a cold water or warm water macroinvertebrate community exists in that surface water. However, ADEQ disagrees that independent analyses of every surface water in the state must be performed and site-specific findings made before ADEQ can revise A&Wc and A&Ww designated uses for the state's surface waters. ADEQ intends to rely on the 5000 foot elevation contour to establish the A&Wc and A&W designated uses for the reasons explained in the preamble. ADEQ acknowledged that there may be exceptions to the use of this general decision principle. If the application of the general decision principle results in the establishment of an inappropriate aquatic life designated use for a specific surface water, a person can bring site-specific information to ADEQ's attention to demonstrate that a different macroinvertebrate community exists in the surface water and that a different aquatic life designated use is more appropriate. It is not practical for ADEQ to make site-specific findings on the benthic macroinvertebrate communities that exist in every surface water in Arizona nor are site-specific findings necessary to establish designated uses. ADEQ's biocriteria program research adequately supports the use of the 5000 foot elevation contour as a predictive model for aquatic life use designation. No change to the rules.

32. *Comment:* ADEQ's proposal to classify a water as either A&Wc or A&Ww due only to the elevation of the water is arbitrary. The existence of salmonids in a surface water depends on a variety of factors, including, but not limited to, the temperature of the water and the amount of direct sunlight the water receives. Establishing a bright line rule at the 5000 foot contour may make it easier for ADEQ to classify a water, but it does not necessarily make the classification more accurate. We propose that ADEQ balance several factors in determining how to classify a particular surface water located between 4000 and 6000 feet. This will ensure that those waters close to the 5000 foot contour line are more carefully evaluated to ensure the proper classification.

Response: ADEQ does not agree with the comment that ADEQ's approach of using benthic macroinvertebrate communities and the 5000 foot elevation contour to establish aquatic life designated uses is arbitrary. The scientific and technical rationale for using the approach is fully explained in the preamble and in responses to comments. Moreover, a definition of A&Wc or A&Ww of designated uses that includes an elevation range between 4000 and 6000 feet and a balancing of factors like water temperature, canopy cover, and the amount of sunlight a surface water receives would require the site-specific evaluation of every surface water in that elevation range in the state to establish designated uses. ADEQ cannot practically implement definitions of the A&Wc and A&Ww designated uses that require the balancing of site-specific factors for each surface water. No change to the rules.

33. *Comment:* A number of revisions affecting use designations, the tributary rule, and the applicability of criteria to protect specific waters rely upon macroinvertebrate data gathered as part of the state's bioassessment program. EPA has a number of concerns about this approach. As you are aware, EPA's criteria are designed to protect aquatic communities based on data points that include both macroinvertebrates and fish. We do not have confidence that defining beneficial uses according to the distribution of macroinvertebrate communities will adequately protect cold water species such as trout throughout their distribution in Arizona. For example, we are aware of trout populations that are adapted to lower elevations in some streams. These fish would not be protected by cold water criteria in the proposal currently under consideration by ADEQ. Similarly, cold water releases from dams in the state occur below the 5000 foot elevation supporting cold water fisheries (for example, Glen Canyon Dam). We recommend that the state consider such site-specific conditions before final adoption into rule. The U.S. Fish and Wildlife Service's [USFWS] Gila Trout Recovery Plan references literature concerning the historic distribution of this federally-listed endangered species to elevations as low as 1660 meters (it is difficult to assume that fish will recognize a 135 meter difference in elevation). The recovery plan also suggests that Gila trout may be tolerant of higher water temperatures (up to 27° C for up to two hours). The state's proposal could result in revisions to cold water aquatic life use designations that might be in conflict with the USFWS Recovery Plan for this species. We once again recommend that ADEQ seek review of this proposal by the Arizona Game and Fish Department, USFWS, and the academic community before final adoption into rule. EPA requests that the results of such reviews be included pursuant to

40 CFR § 131.6. In addition, as with any use modification, the state must provide documentation to EPA consistent with 40 CFR § 131.10(g) to support the revision of use designations. We request that ADEQ provide a map or GIS-based demonstration of where uses will be modified based on macroinvertebrate community distributions compared with the distribution of current use designations as part of such documentation.

Response: EPA is concerned about ADEQ's approach to the use of the 5000 foot elevation contour and benthic macroinvertebrate community data to define aquatic life designated uses for cold and warm water streams. EPA states that it does not have confidence that defining the A&W(c) and A&W(w) designated uses according to the distribution of benthic macroinvertebrate species will adequately protect cold water species, such as trout, throughout their distribution in Arizona. ADEQ does not share these concerns. In fact, ADEQ thinks that the use of the benthic macroinvertebrate data will result in more comprehensive protection of cold water species in streams than the use of the current presence / absence test for salmonids. More comprehensive water quality protection is afforded to perennial, wadeable streams because the use of the 5000 foot elevation contour results in the establishment of the A&W(c) designated use in cold water streams where there is little or no data on the presence or absence of salmonids. As noted in the preamble to the final rules, virtually all surface waters contain benthic macroinvertebrates but many streams do

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not have reliable data on the presence or absence of salmonids. ADEQ proposes to establish the A&W(c) designated use for 48 stream segments that currently have an A&W(w) designated use. ADEQ proposes to change the designated uses of 29 streams identified in Appendix B of the proposed rules from A&W(c) to A&W(w). 23 of these 29 streams are tributaries to the Colorado River in the Grand Canyon. ADEQ asked for comments from the National Park Service on the proposal to revise the designated uses of these 22 streams from A&W(c) to A&W(w). Mr. John Rihs, Grand Canyon National Park, Division of Resource Management, was unaware of any trout studies that had been done in the Grand Canyon but he agreed that ADEQ's bioassessment data was the best place to start when determining whether tributaries were cold or warm water habitats (Personal communication on 4 / 26 / 01). As EPA is aware, the Colorado River in the Grand Canyon is a cold water stream because of the release of cold water from Glen Canyon Dam. Historically, the Colorado River and its tributaries in the Grand Canyon did not support salmonids until they were introduced at Lee's Ferry after the construction of the Glen Canyon Dam. The Colorado River below Glen Canyon Dam is one of the exceptions to the use of the 5000 foot elevation contour. While the Colorado River in the Grand Canyon is below 5000 feet in elevation, it has an A&Wc designated use. While the main stem Colorado River is a cold water river, ADEQ believes that the majority of the Grand Canyon tributaries are appropriately identified as warm water streams. However, we recognize that there may be exceptions to the use of the 5000 foot elevation contour to assign A&W(w) designated uses to some of these streams. Some of the 23 Grand Canyon tributaries may be cold water streams because their sources are cold water springs flowing from deep aquifers.

ADEQ solicited public comments on the revision of the designated uses of the surface waters, including the Grand Canyon tributaries in the formal rulemaking process. However, we did not receive any information relating to the appropriate aquatic life designated uses of the tributaries Grand Canyon. In the absence of information, ADEQ established aquatic life designated uses for the Grand Canyon tributaries using the 5000 foot elevation contour. EPA stated its concern that the proposed use of the 5000 foot elevation contour may not adequately protect the Gila trout because its historic distribution is reported in the literature to extend to elevations as low as 1660 meters. In fact, the use of the 5000 elevation contour results in the establishment of an appropriate A&W(c) designated use to protect aquatic habitat for the Gila trout because 1660 meters converts to 5445 feet [1660 meters multiplied by a conversion factor of 3.28 feet per meter]. There should be no conflict between the proposed definitions of the A&W(c) and A&W(w) designated uses, the use of the 5000 foot elevation contour, and the historic distribution of the Gila trout as reported in the literature. Minckley notes in *Fishes of Arizona* that the distribution of the Gila trout apparently was originally present in tributaries to the Verde River and otherwise occurred in the headwaters of the upper Gila River in New Mexico. According to Minckley, the known distribution of Gila trout at the time of publication of his *Fishes of Arizona* definitely included only 3 or 4 *high elevation* creeks in New Mexico (emphasis added). It seems clear from EPA's description of the Gila trout recovery plan and Minckley's description of the distribution of Gila trout that the fish are typically found in headwater streams above 5000 feet. A final point: Minckley notes in his text that the Gila trout's major foods are aquatic insects. Minckley states that the occurrences and abundances of the various kinds of aquatic insects in the stomachs of Gila trout are well correlated with the abundances of insect groups in streams. This fact further supports the use of the benthic macroinvertebrate community, the prey base of the Gila trout, as a basis for establishing aquatic life designated uses for cold and warm water streams. Arizona's other native trout, the Apache trout, occurs naturally only in small montane streams and headwaters of the Black and White river drainages at even higher elevations (2500+ meters or 8200+ feet) [See *Atlas of North American Freshwater Fishes*, Lee, David S., et al., North Carolina State Museum of Natural History, 1980]. Other salmonids introduced to Arizona surface waters include brook trout, brown trout, rainbow trout, and cutthroat trout. According to Minckley, the brown trout occurs in Arizona streams above 2000 meters (6560 feet) in elevation. Minckley does not describe the range of the brook trout but he notes that brook trout have a low tolerance for high water temperatures and a high tolerance for extremely low temperatures. Given their low tolerance for high water temperatures, it is unlikely that brook trout occur in Arizona streams below 5000 feet. According to Minckley, cutthroat trout are rare in Arizona streams. A map showing the distribution of cutthroat trout in the *Atlas of North American Freshwater Fishes* shows cutthroat trout occurring only in the Colorado River in the Grand Canyon. ADEQ does not propose to change the A&W(c) designation for the Colorado River from Lake Powell to Topock, Arizona. The rainbow trout is probably the most widely distributed trout in Arizona. Resident stocks of rainbow trout are described as inhabiting small, headwater streams or large rivers. As with most salmonids, rainbow trout are cold water fish and few will live when water temperatures exceed 25° C. Feeding and general activities decrease at water temperatures higher than 20°C. Minckley notes that excellent survival and production of rainbow trout has been realized in the mainstream reservoirs on the Colorado River and in a number of smaller impoundments "at intermediate to high elevations." ADEQ's proposal to revise designated uses on the basis of the 5000 foot elevation contour does not affect any lakes or impoundments.

Minckley states in *Fishes of Arizona* that "the highest elevation brooks and creeks support trouts. They are cold, swift and turbulent, relatively infertile, and clear, surrounded by coniferous forest and in some areas extensive galleries of deciduous trees." This description is consistent with a description of the Arizona-New Mexico Mountains, Semi-Desert / Open Woodland / Coniferous Forest / Alpine Meadow ecoregion. The elevation range for this ecoregion is 6,000 to 12,600 feet. Minckley's *Fishes of Arizona* includes a map showing areas in Arizona stocked with or maintaining reproducing populations of introduced salmonids. While the map does not have enough detail to indicate elevations at the boundaries, it is generally consistent with areas of Arizona that are above 5000 feet in elevation. The large shaded area on the map generally follows the boundaries of the Central Highlands physiographic province in Arizona. The Central Highlands Province is characterized by mountainous terrain with shallow intermontane basins. Altitudes in the Central Highlands range from about 2000 feet near the confluence of the Salt and Verde Rivers to

11,400 feet at Mt. Baldy in the White Mountains. In general, most of the Central Highlands Province of Arizona is above 5000 feet in elevation.

ADEQ does not understand EPA's concern about the use of macroinvertebrate communities when EPA's own guidance for biological criteria supports the use of biological criteria to refine aquatic life use classifications [See Biological Criteria, National Program Guidance for Surface Waters, U.S. Environmental Protection Agency, Office of Water, Regulations and Standards (WH-585), Washington, D.C., EPA-440 / 5-90-004, April 1990, pp.17-18). EPA's national program guidance document states that the refinement of designated uses may be accomplished within a state's current designated use classification system and that data collected from bioassessments as part of a developing biocriteria program can reveal unique and consistent differences among aquatic communities that inhabit different surface waters with the same designated uses. This is precisely what has been done in Arizona. ADEQ's research into reference conditions for its biocriteria program has led to a better way of refining the A&W(c) and A&W(w) designated uses. The use of the benthic macroinvertebrate community to define A&W(c) and A&W(w) designated uses is "good science" and it is supported by nine years of bioassessment research in Arizona.

Finally, ADEQ recognizes that site-specific conditions can alter temperature regimes in perennial, wadeable streams and that there may be exceptions to the general approach of using the 5000 foot elevation contour as the basis for establishing A&W(c) and A&W(w) designated uses. EPA cites water releases from dams as an example of a site-specific condition that ADEQ should consider when making decisions establishing A&W(c) and A&W(w) designated uses. ADEQ acknowledges in the preamble to the rules that such exceptions may exist. ADEQ took site-specific factors into consideration when making decisions regarding whether A&W(c) or A&W(w) designated uses should apply in individual surface waters. For example, the segment of the Colorado River from Lake Powell to Topock has the A&W(c) designated use even though this reach of the Colorado River is below the 5000 foot elevation. There may be warm water streams at elevations above 5000 feet because the source of water for the stream is a geothermal spring. Similarly, there may be cold water streams at elevations below 5000 feet because the source of water is groundwater flowing from a cold water spring or the temperature of the water is affected by a release of water from a dam.

34. *Comment:* ADEQ must re-examine use attainability for Clean Water Act § 101(a)(2) uses that were previously modified or not designated by the state and re-affirm that non-attainment of uses for these water bodies continues. Such reaffirmation should be included as part of the supporting documentation. Should new information become available regarding attainment of uses for these waters, ADEQ should modify the state rules accordingly.

Response: ADEQ agrees that it is required to re-examine use attainability for Clean Water Act § 101(a)(2) designated uses. The large majority of surface waters listed in Appendix B have designated uses that are consistent with § 101(a)(2) of the Act. ADEQ intends to rely on previously submitted use attainability analyses and re-affirm that conditions have not changed for several categories of surface waters, including ephemeral waters and effluent-dependent waters.

R18-11-105. Tributary Rule

35. *Comment:* AMA supports ADEQ's proposal to eliminate the language in the current tributary rule that applies the designated uses for the nearest listed downstream surface water to an unlisted perennial or unlisted tributary. This change will avoid the imposition of inappropriate designated uses to upstream perennial or intermittent tributaries.

Response: ADEQ agrees. The current tributary rule assigns designated uses from the "...nearest downstream surface water listed in Appendix B that is not an ephemeral water or effluent-dependent water" to unlisted tributaries that are neither ephemeral waters nor EDWs [See R18-11-105(3) and (4)]. The original intent of this rule was to ensure attainment of surface water quality standards in the nearest downstream, perennial surface water. ADEQ revised the rule because of concern that its implementation more frequently results in the establishment of inappropriate designated uses for upstream tributaries. In many cases, the nearest downstream, perennial surface water is separated from an unlisted tributary by stream reaches that are either ephemeral or intermittent waters. Often, the assignment of designated uses such as the domestic water source, agricultural irrigation, or agricultural livestock watering from the nearest downstream surface water to an unlisted tributary is inappropriate because they are not existing uses of the unlisted upstream tributary. Also, the assignment of designated uses to an unlisted tributary is usually unnecessary to maintain and protect water quality in the downstream, perennial surface water because, in most cases, the unlisted tributary and the nearest downstream, perennial surface water are spatially interrupted. Finally, the assignment of "fishable, swimmable" designated uses to unlisted tributaries that are perennial or intermittent through the proposed tributary rule will: 1) provide a high level of water quality protection to the unlisted tributaries, and 2) ensure that water quality in the nearest downstream perennial surface water is maintained and protected.

36. *Comment:* AMA disagrees with ADEQ proposals to impose full-body contact (FBC) standards on all unlisted perennial and intermittent tributaries and to determine the classification of aquatic and wildlife standards based solely on elevation. In most instances, unlisted perennial and intermittent tributaries would not contain enough flow to support the FBC use and it therefore would be inappropriate to use FBC as a default designated use. As an alternative, partial-body contact (PBC) should be the default designated use unless there is evidence to the contrary. Also, as discussed above, and as recognized by ADEQ, the 5000' elevation contour may not be the appropriate indicator in all situations for the appropriate aquatic and wildlife designation. ADEQ should add language to the tributary rule that clarifies that while the 5000 foot elevation is an important consideration, a water body must actually be supporting cold water or warm water macroinvertebrate communities to receive such designations.

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Response: The assignment of the full-body contact recreation, fish consumption, and either an aquatic and wildlife (cold water) or aquatic and wildlife (warm water) designated uses to perennial and intermittent tributaries is consistent with the “fishable and swimmable” goals of the Clean Water Act. The general purpose of the tributary rule is to establish default water quality standards for unlisted tributaries that will provide for the protection of fish, shellfish, and wildlife and for recreation in and on the water. The final tributary rule takes a conservative and protective approach that establishes appropriate water quality goals for unlisted tributaries that are consistent with the interim goals of the Clean Water Act. Also, the approach taken by ADEQ in the tributary rule is consistent with the way that ADEQ establishes water quality standards for other perennial or intermittent waters specifically listed in Appendix B. Finally, it must be recognized that if inappropriate surface water quality standards are established by default through the operation of the tributary rule, there is appropriate remedy. Unlisted tributaries with inappropriate designated uses can be identified and specifically listed in Appendix B with their appropriate designated uses. No change to the rules.

R18-11-107. Antidegradation

37. *Comment:* The proposed addition of the word, “existing,” before “water quality” in R18-11-107(A) is confusing. I don’t think it is necessary.

Response: ADEQ agrees that the word, “existing,” in R18-11-107(A) is unnecessary. ADEQ did not revise the final rule by adding “existing” to R18-11-107(A) as proposed.

38. *Comment:* We support adding language under the Tier 2 standards which makes it clear that the water quality cannot be lowered to a level that does not comply with the applicable water quality standards.

Response: ADEQ appreciates the statement of support for this revision of the antidegradation rule. The additional language clarifies antidegradation requirements by identifying the baseline level of water quality that must be maintained in Tier 2 surface waters.

39. *Comment:* Regarding the Tier 3 antidegradation standard, we disagree with the elimination of the protection for a proposed unique water and believe that the existing water quality should be maintained and protected in a surface water that has been proposed for classification as a unique water. ADEQ’s justification for eliminating this protection is that someone might possibly at some point nominate surface waters that are threatened by mining, grazing, timber harvesting, growth and development, or other land uses but that cannot reasonably be considered to be outstanding state resource waters. First, ADEQ offers nothing to substantiate this concern. Next, what about those streams that can reasonably be considered outstanding state resource waters that might be threatened by these particular activities? How is the agency going to provide interim protections so these waters might at least be considered? How are you going to ensure that someone doesn’t fast forward a development or other proposal to ensure that the water cannot be considered as a unique water because in the interim it has been degraded? Again, ADEQ should be looking to default to more protection, not less protection. Finally, we believe eliminating this interim protection is a violation of the anti-backsliding provisions of the Clean Water Act.

Response: ADEQ eliminated Tier 3 antidegradation for proposed unique waters for several reasons. First, the repeal of the language is consistent with federal antidegradation policy that extends Tier 3 antidegradation protection only to those surface waters that constitute outstanding national resource waters. Second, it is unclear how the extension of Tier 3 antidegradation protection to a proposed unique water can be practically implemented in the absence of data on existing water quality in a proposed unique water. In most cases, there is little or no data on existing water quality for surface waters that are proposed for unique waters classification. Third, the extension of Tier 3 antidegradation protection to proposed unique waters only extends Tier 3 antidegradation protection for a relatively short period of time. At most, Tier 3 antidegradation protection is extended six months to one year before it otherwise would apply.

As stated in the preamble, ADEQ is concerned that the extension of Tier 3 antidegradation protection to proposed unique waters may create an incentive for persons to nominate surface waters for unique water classification in the hope that Tier 3 antidegradation protection may be obtained for the surface water during the pendency of formal rule-making procedures. ADEQ is concerned that the extension of Tier 3 antidegradation to *proposed* unique waters encourages the nomination of surface waters believed to be threatened by mining, grazing, timber harvesting, growth and development, or other land uses, irrespective of the merits of their nomination as outstanding state resource waters that are of exceptional recreational or ecological significance.

Tier 3 antidegradation protection should be provided to unique waters, but only after the formal rulemaking process is complete and the surface water is formally recognized as one of Arizona’s outstanding resource waters. Moreover, this protection should only be afforded to a unique water after a full and complete public participation process is completed and an informed decision is made that takes the costs and benefits of unique water classification into account. The primary benefit of a unique water classification is Tier 3 antidegradation protection. This benefit should not be afforded to a surface water prior to the development of a complete administrative record through the rulemaking process, including a cost / benefit analysis of a unique waters classification that is required for approval by the Governor’s Regulatory Review Council.

It should be noted that proposed unique waters are still protected by the state antidegradation rule. Proposed unique waters are protected by the Tier 2 provisions of the antidegradation rule that require the maintenance and protection of existing water quality in high quality surface waters.

Finally, the repeal of Tier 3 antidegradation protection for proposed unique waters does not violate the anti-backsliding provisions of the Clean Water Act. The anti-backsliding provision of the Clean Water Act relates primarily to the establishment of NPDES permit conditions. The Act generally prohibits the establishment of permit conditions in an NPDES permit that are less stringent than those established in a previous permit. ADEQ's decision to repeal Tier 3 antidegradation protection in proposed unique waters will have no effect on the implementation of anti-backsliding in permits. Even if there was a point source discharge to a proposed unique water (and there are none), the anti-backsliding provisions of the Clean Water Act apply only to the NPDES permit. Less stringent permit conditions than those established in a previous permit are not allowed, regardless of the state's revisions to its Tier 3 antidegradation rule.

40. *Comment:* We strongly oppose the elimination of interim antidegradation protection for proposed unique waters. Considering ADEQ's position that impaired waters cannot be classified as unique, the repeal of the interim protection essentially provides incentive to pollute a water before ADEQ completes the unique water review process. The creation of an incentive to pollute a water is clearly contrary to the Clean Water Act as well as the antidegradation program. ADEQ could easily implement the Tier 3 program on proposed unique waters by delaying any new uses until after ADEQ makes its determination. Due to Arizona's erratic weather, water quality could quickly degrade, particularly during the monsoon season. As a result, simply because the antidegradation policy would be in place a "short" time, does not mean that the water would not reap the benefits of such protection. Furthermore, ADEQ has presented no documentation that implementation of Tier 3 on a short-term basis would not improve water quality. Finally, the removal of Tier 3 protection for nominated unique waters may violate the Clean Water Act's anti-backsliding provision. While it is theoretically possible that nominations would occur merely to stop activities associated with degradation of the waters, ADEQ has presented no documentation of such an occurrence. In addition, contrary to ADEQ's characterization, the 37 nominated stream segments are not large by any stretch of the imagination, particularly when compared with the thousands of stream miles that were not nominated to be unique waters. The Clean Water Act requires the restoration and maintenance of water quality. Unless and until ADEQ allows impaired waters to be classified as unique, interim measures must be in place to protect nominated waters from degradation during the review process.

Response: ADEQ disagrees that the repeal of Tier 3 antidegradation protection creates an incentive to pollute proposed unique waters. First, proposed unique waters will continue to be regulated by surface water quality standards, including Tier 2 of the antidegradation rule. Tier 2 of the state antidegradation rule provides a high level of water quality protection to proposed unique waters. In fact, Tier 2 and 3 both provide essentially the same level of protection of existing water quality protection. Both tiers require that existing water quality be maintained and protected. The only difference between Tier 2 and 3 is that Tier 3 does not permit limited degradation of existing water quality that is allowable under Tier 2. However, under the Tier 2 antidegradation rule, the possibility of allowing even limited degradation is small. The Tier 2 antidegradation rule requires demonstrations that: 1) the highest statutory and regulatory requirements for new and existing point sources are achieved, 2) that all cost-effective and reasonable best management practices for nonpoint source pollution control are implemented, and 3) allowing lower quality is necessary to accommodate important economic or social development in the area where the surface water is located before any limited degradation is allowed. Second, while limited degradation is possible, surface water quality standards must still be met. Finally, ADEQ would have to hold a public hearing to discuss the issue of allowing limited degradation in a proposed unique water under the Tier 2 antidegradation rule. The Tier 2 antidegradation rule adequately protects proposed unique waters during the pendency of a rulemaking to classify it a unique water. No change to the rule.

41. *Comment:* I do not favor the proposed change to R18-11-107(D) as written. I would like the Director of ADEQ to retain the authority to protect the existing water quality of any waters that *he or she as Director proposes* [emphasis added] for unique water designation. My suggestion is different for a stream that is nominated solely by the public (such as me) who does not have the Director's endorsement as well (at least not yet). I would like to see the possibility of two paths to unique water designation: One by the Director's nomination and the other by citizen's nomination. In this subsection, I urge that a unique water nomination by the Director should carry the interim Tier 3 antidegradation protection until resolved through the rulemaking process.

Response: ADEQ disagrees that there should be two paths to unique water designation as suggested in the comment. That is, one path initiated by an ADEQ nomination and the other initiated by citizen nomination. ADEQ also disagrees that proposed nominations by ADEQ should carry interim Tier 3 antidegradation protection during the pendency of the rulemaking process. ADEQ's reasons for eliminating Tier 3 antidegradation protection for proposed unique waters are fully explained in the response to Comment #39 and in the preamble.

42. *Comment:* The Arizona Mining Association agrees with ADEQ's proposal to delete the provision that waters proposed for unique water classification should be considered as Tier 3 waters and receive full protection even though the unique water classification is not yet finalized. The application of Tier 3 status on waters that have only been nominated for unique water status is difficult to implement and creates an incentive for multiple petitions for nomination in an attempt to impose limitations on waters absent any specific finding that unique water status is actually warranted.

Response: ADEQ agrees that Tier 3 antidegradation protection should not be applied to proposed unique waters for the reasons already stated in the preamble and in previous responses to comments.

43. *Comment:* With respect to ADEQ's ongoing efforts to develop antidegradation implementation procedures, the Arizona Mining Association questions whether the procedures can be developed completely through guidance or

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whether parts of the procedures should be addressed in rule. In fact, certain threshold issues, including when antidegradation review is triggered, should be set forth in rule to clarify the antidegradation rule and its potential scope and application. The Arizona Mining Association reserves its final positions on this issue pending further developments on the antidegradation implementation procedures. ADEQ should clarify in the final rule preamble that it is not currently following the draft implementation procedures for antidegradation that ADEQ developed in 1994 entitled "Implementation Guidelines for the State of Arizona Antidegradation Standard." As ADEQ has stressed on several occasions during early meetings of the antidegradation implementation procedures stakeholders group, it does not follow the 1994 draft but rather applies different procedures and policies when conducting antidegradation reviews, which procedures and policies will ultimately be reflected in revised implementation procedures. The status of the 1994 draft should be clarified because the preamble language for the proposed rule suggests that the 1994 draft is being used presently as the state's de facto antidegradation policy.

Response: ADEQ agrees with the comment that it may not be possible to develop antidegradation implementation procedures completely through guidance and that some antidegradation issues may need to be addressed in rule. A.R.S. § 49-232 requires the adoption of rules specifying implementation procedures for narrative water quality standards if violations of the standards are to be grounds for § 303(d) listing or water quality assessment purposes. The rules must specifically identify the objective basis for determining that a violation of a narrative criterion exists before any surface water may be identified as impaired on the basis of a narrative criterion. The antidegradation rule is a narrative water quality standard. Thus, before ADEQ could list a surface water as impaired because the provisions of the antidegradation rule are not met, ADEQ must develop antidegradation implementation procedures in rule. ADEQ is committed to the development of complete and adequate antidegradation implementation procedures through a rulemaking process that will include public participation in 2002.

In the interim period before final antidegradation implementation procedures rules are adopted, ADEQ will continue to rely on the "Implementation Guidelines for the State of Arizona Antidegradation Standard" and

developed in 1994 and other internal policies and checklists based on those implementation guidelines to conduct antidegradation reviews and implement the state antidegradation rule through NPDES permits.

44. *Comment:* Consistent with 40 CFR 131.13, the state must submit adopted antidegradation implementation procedures for EPA review and approval.

Response: ADEQ acknowledges that it must submit antidegradation implementation procedures to EPA for EPA review and approval. 40 CFR § 131.6(d) states that an antidegradation implementation policy consistent with 40 CFR § 131.12 is one of the minimum requirements for a state's water quality standards submission to EPA. ADEQ believes that R18-11-107 already satisfies this minimum requirement. However, ADEQ acknowledges that 40 CFR § 131.6(f) requires submittal of information on general policies applicable to state-adopted water quality standards that may affect their application and implementation. ADEQ will *not* be able to complete the revision of its antidegradation implementation procedures on the same schedule as this triennial review of surface water quality standards. ADEQ expects to initiate a stakeholder process to address antidegradation implementation procedures in 2002.

45. *Comment:* Please provide us with a copy of the proposed antidegradation implementation guidance since their approval deadline is concurrent with the surface water quality standards. Without guidance to implement the proposed antidegradation rule, increases in pollutant levels will occur and degradation of existing water quality may occur. While there has been draft antidegradation implementation guidance in place for many years now, formal guidance needs to be approved. Without it, the Service recommends that a "may affect" is likely to adversely affect determination would be appropriate in considering the threats to endangered or threatened species.

Response: ADEQ has draft antidegradation implementation guidance in place to prevent the degradation of existing water quality [See "Implementation Guidelines for the State of Arizona Antidegradation Standard"]. The U.S. Fish and Wildlife Service should review the existing guidance for adequacy before making a jeopardy determination to endangered or threatened species.

46. *Comment:* Asarco supports the proposal to not automatically apply Tier 3 antidegradation protection to proposed unique waters. A proposed unique water may not ultimately be classified as unique after public comment and GRRC review. Applying Tier 3 antidegradation protection for a short period, and then removing it, could cause disruptions in the area of the proposed classification (for example, the denial of permits or imposition of more stringent permit conditions which ultimately may not prove to be necessary). The proposal rightly applies Tier 3 protection only to waters that have been formally classified as unique after the rulemaking process is complete.

Response: ADEQ agrees. The final rule does not apply Tier 3 antidegradation protection to proposed unique waters.

R18-11-108. Narrative Water Quality Standards

47. *Comment:* We are concerned about the elimination of the turbidity standard before an adequate replacement is established. It is unclear to us how the narrative bottom deposit standard for only wadeable, perennial streams and numeric suspended solids standard for only those water bodies designated for drinking water will adequately protect aquatic life and wildlife. It seems like there is a huge gap here. We would like to see a suspended solids standard for aquatic life before the turbidity standard is eliminated.

Response: ADEQ is proposing a numeric suspended sediment concentration standard to protect aquatic life in surface waters with the A&Wc and A&Ww designated uses to replace the current turbidity criteria. [See R18-11-109(D)]. The numeric SSC criterion is an adequate replacement for the turbidity standard.

In addition, ADEQ proposes to adopt a narrative bottom deposit standard that is designed to protect aquatic life. For the first time, ADEQ has developed draft implementation procedures that can be used to objectively determine compliance with the bottom deposits narrative standard. These implementation procedures do not rely on questionable surrogate measures like turbidity to determine if aquatic life is adversely affected by excessive sedimentation. The draft implementation procedures employ bioassessment procedures that *directly* measure the health of the benthic macroinvertebrate community and habitat assessment procedures that quantitatively assess sedimentation. ADEQ admits that, at least initially, the narrative bottom deposits standard has limited application. That is, the narrative bottom deposits standard can be implemented only in Wadeable, Perennial streams. The current science that supports our bioassessment procedures and indexes of biological integrity is limited to Wadeable, Perennial streams. Aquatic life will be protected by a combination of technology-based effluent guidelines and numeric and narrative standards that are intended to prevent sedimentation. Aquatic life in EDWs will be protected by effluent guidelines for wastewater treatment plants that regulate the point source discharge of total suspended solids. Surface waters with the A&Ww and A&Wc designated uses will be protected by the new suspended sediment concentration standard. Wadeable, Perennial streams will be protected by the bottom deposits narrative standard. ADEQ disagrees that there will be a “huge gap” in the level of protection afforded aquatic life. On the contrary, ADEQ believes that the new water quality standards provide a higher level of protection that is more scientifically defensible than the level of protection provided by the current turbidity criteria.

48. *Comment:* We support a narrative standard that prohibits suspended solids in amounts or concentrations that interfere with the ability of a water treatment plant to comply with Safe Drinking Water Act requirements. This is an important public health protection as excessive concentrations of suspended solids can result in operation problems for water treatment plants and also make it difficult to disinfect water for certain pathogens.

Response: ADEQ agrees that a new narrative standard that prohibits levels of suspended solids that impair the ability of a water treatment plant to provide safe drinking water under the Safe Drinking Water Act is an important new regulatory tool for the water quality standards program. Water treatment plants that rely on surface water sources must provide filtration treatment and the plants must achieve certain prescribed turbidities for finished drinking water [See R18-4-302 for example]. Achieving prescribed final turbidities in finished drinking water is important because it is directly related to a water treatment plant’s ability to adequately disinfect water to inactivate or remove bacteria, viruses, and pathogenic microorganisms such as *Giardia lamblia* and *Cryptosporidium*.

49. *Comment:* The City supports the inclusion of a narrative standard that addresses excessive amounts of suspended solids in surface waters. We are trying to understand the benefits of the proposed addition of suspended solids to this narrative standard and the effects of its implementation, especially on water treatment plants. First the breadth of this narrative standard is not entirely clear to us because it relates to “pollutants” that are suspended in the water column. We believe the rule would be clearer if it specified suspended solids. There are well-established test methods for suspended solids but we know of no test methods for suspended pollutants. Moreover, the Clean Water Act provides for technology-based permit limits for suspended solids but not for suspended pollutants.

Response: ADEQ agrees. The intent of the proposed narrative standard is to establish a narrative criterion to regulate levels of suspended solids in a surface water that serves as a raw source of water for a potable water treatment plant. ADEQ originally proposed the narrative standard in R18-11-108(A) in an attempt to use the same introductory phrase “A surface water shall be free from pollutants in amounts or combinations that...” used for the other narrative water quality standards. However, ADEQ agrees that the proposed standard should specifically address total suspended solids for the reasons stated by the commenter. For this reason, ADEQ moved the revised narrative standard from subsection (A) and placed it in a new subsection (C). ADEQ revised the narrative standard so it specifically references suspended solids.

50. *Comment:* It is difficult to understand what constitutes a domestic water source designated use impairment under this narrative standard considering that water treatment plants are designed to remove suspended solids. The DWS definition says that “coagulation, sedimentation, filtration, disinfection, or other treatments may be necessary to yield a finished water suitable for human consumption.” The proposed rule could be interpreted in two extreme ways. On one hand, the rule could be construed to allow unlimited suspended solids up to the point where the solids handling capacity of a water treatment plant is overwhelmed. Conversely, the rule could be interpreted to prohibit any impairment at all; meaning that any discharge of suspended solids that raises water treatment costs is prohibited. The rule needs to be clarified. The degree to which suspended solids would impair the DWS use is unclear since surface water treatment plants are designed to remove suspended solids. It is unreasonable for ADEQ to promulgate a rule that places the burden of dealing with suspended solids almost entirely on the water treatment plant operators rather than on upstream dischargers. The amount of suspended solids that may be in the water before the DWS use is deemed impaired appears to be defined by the amount of solids the treatment plant is capable of removing. The standard affords little protection to treatment plant operators as the standard is not violated until the water treatment plant can no longer treat the water. The rule should provide as follows: “Result in the presence of suspended solids in quantities or concentrations that either interfere with the treatment processes at the nearest downstream potable water treatment

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plant or substantially increase the cost of handling solids produced at the nearest downstream potable water treatment plant.” Affected stakeholders can work with ADEQ to develop guidance to implement this rule.

Response: ADEQ agrees that the narrative standard would benefit from the clarifying language suggested by the commenter. ADEQ revised the narrative standard rule and adopted the suggested language in a new subsection (C). As with other narrative water quality standards, ADEQ will have to develop implementation procedures for the narrative standard before violations of the standard can be used for § 303(d) listing purposes. ADEQ welcomes the participation of interested stakeholders, including drinking water purveyors and members of the public, in the development of specific guidance to implement the standard. ADEQ anticipates a need for guidance on what constitutes “interference with treatment processes” or a “substantial” cost increase that results in a violation of the narrative standard. The operational experience of water treatment plant operators will be invaluable in the stakeholder process to develop that guidance.

51. *Comment:* The Pima County Wastewater Management Department (PCWMM) has serious concerns about the use of the implementation guidelines for the narrative toxics standard in determining whether narrative water quality standards are being met in Arizona. Some of our specific concerns are listed below:

1. Currently, the whole effluent toxicity test (WETT) method promulgated under 40 CFR Part 136, is under litigation and EPA is scheduled to promulgate a new WETT procedure. Because of this, it is premature for ADEQ to adopt the proposed narrative toxicity standard implementation guideline.
2. The guideline proposes listing under § 303(d) of the Clean Water Act if: 1) two ambient biomonitoring tests taken at least 24 hours apart exceed 0.3 toxicity units (0.3 Tua) or 2) the geometric mean of 4 consecutive chronic biomonitoring tests, each taken at least 24 hours apart exceed 1.0 toxicity unit (1.0 Tuc). In order to be consistent with ADEQ’s proposed listing criteria rules, R18-11-604(C)(1)(b), the samples should be collected more than 7 days apart to ensure that the samples had temporal independence which is necessary to properly characterize the attainment status of a water body.
3. Whole effluent biomonitoring in NPDES Permits: When biomonitoring is a condition of a NPDES permit and the permitted discharge is to perennial and intermittent surface waters, a set of minimum requirements shall be complied with. This section of the implementation guidance seems to be adding additional permit conditions, other than those that may already be contained in an existing NPDES permit.
4. Wildlife toxicity: If tissue samples from at least two different prey species of high order predators such as bald eagles, osprey, cormorants, river otters, raccoons, and bobcats exhibit certain factors related to toxicity then the stream reach will be listed. This approach does not take into consideration whether the high order predators mentioned are present, or may be present, within the boundary of the stream reach being studied. The guidance document also does not mention how the prey species to be tested will be selected in relation to being a typical food for the high order predators mentioned.

These guidelines have been discussed in the public hearing as the implementation guidances for the narrative standards. Because these guidelines establish numeric limits, they effectively become rules. Therefore, these guidelines are subject to the State Administrative Procedures Act. PCWMM has other significant concerns with these guidelines. However, we understand that ADEQ has decided to hold the guidance in abeyance until a formal rulemaking process can commence early next year. PCWMM strongly supports this as the most appropriate course of action in relation to these implementation documents.

Response: ADEQ agrees that implementation guidance documents for narrative standards should be developed through a public stakeholder process in 2002. ADEQ also agrees that rulemaking procedures must be used to specify the objective bases for determining violations of narrative standards for purposes of listing impaired waters under § 303(d) of the Clean Water Act [as required by A.R.S. § 49-232(C)(4) and (F)]. However, ADEQ does not agree that the agency is precluded from using the current narrative implementation guidance documents for other regulatory purposes. For example, the current narrative toxics standard guidance document may be used as a basis for the development of appropriate NPDES permit conditions to limit whole effluent toxicity in wastewater discharges.

ADEQ agrees that all aspects of the implementation procedures for a narrative standard should be “on the table” and subject to comment during the stakeholder process. ADEQ welcomes a full and frank discussion of the commenter’s specific concerns regarding implementation of the narrative toxics standard including what aspects of the guidance should be incorporated into rule. However, not all aspects of its current guidance documents should be held in abeyance during the pendency of any rulemakings to develop new implementation guidance documents to implement § 49-232. ADEQ agrees (and state law requires) that no surface water be listed on the § 303(d) list on grounds of a narrative water quality standards violation until the methodology specifying how ADEQ objectively determines a violation of the narrative standards is prescribed in rule. This does not mean that ADEQ cannot implement aspects of the guidances that are unrelated to water quality assessments under § 305(b) or listing purposes under § 303(d). For example, as noted above, ADEQ may establish NPDES permit limits on whole effluent toxicity in NPDES permits that are up for renewal or under development in 2002.

52. *Comment:* The Pima County Department of Environmental Quality is concerned about the methods for determining compliance with the narrative water quality standards. The use of numeric limits within guidelines effectively

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turns them into rule if used to assess compliance. These guidelines should be re-evaluated with sufficient scrutiny, perhaps through rulemaking procedures, if they are to be used to determine compliance.

Response: ADEQ agrees that the use of the numeric benchmarks in the guidance to determine compliance with narrative standards should be addressed in rule.

53. *Comment:* The Arizona Mining Association (AMA) supports ADEQ's recent decision to delay development of both its proposed bottom deposits narrative standard implementation guidance as well as its expanded toxicity implementation procedures. Because these proposed guidance documents would have established when a violation of the narrative standard is triggered, and would have used numeric criteria to define such violations, the key concepts from these guidance documents should be included in rule rather than in guidance. AMA supports ADEQ's recommendation to create a separate stakeholder process to discuss and develop the guidance documents, including any necessary rule changes or incorporations by reference.

Response: ADEQ intends to develop specific implementation guidance for the bottom deposits narrative standard and the narrative toxics standard in 2002. Obviously, one of the important issues to be decided in the stakeholder process to develop these guidance documents is to determine what parts of the guidance documents should be incorporated into rule.

54. *Comment:* ADEQ should clarify that the narrative standard regarding changes in color from natural background levels of color applies only to stream segments with base flows and not to ephemeral streams. Because ephemeral streams contain water only in response to precipitation events, it is practically difficult, and arguably inappropriate to apply the narrative standard to such waters. ADEQ should amend R18-11-108(A)(9) as follows: "Change the color of the perennial or intermittent surface water from natural background levels of color."

Response: ADEQ disagrees. The narrative color standard applies to all surface waters, not just to perennial and intermittent surface waters.

55. *Comment:* The U.S. Fish and Wildlife Service is concerned about the lack of numeric criteria for oil and grease. Numeric limits are needed since these contaminants can also cause significant wildlife mortalities.

Response: ADEQ cannot establish numeric criteria for oil and grease because of the wide range of compounds included within both categories and because of the great variability in the toxic properties of oil. ADEQ does not have the data to derive numeric criteria for individual petrochemical components at this time. Moreover, EPA has not recommended numeric criteria for oil and grease that are applicable to all types of oil and grease. Instead, EPA recommends using an application factor of 0.01 of the 96-hour LC50 as determined by using continuous flow with a sensitive resident species. In other words, EPA recommends the use of the narrative toxics standard to regulate toxic amounts of oil and grease.

56. *Comment:* We suggest that ADEQ not repeal the narrative organoleptic standards affecting waterfowl at R18-11-108(A)(4). We believe that the state's present standard correctly acknowledges that the wildlife protection and recreational uses listed in § 202 of the CWA can be impaired by pollutants which cause off-flavor of waterfowl. We note that the current Great Lakes Water Quality Agreement (GLWQA) provides for the implementation of remedial action plans if those water bodies uses are impaired by tainting of fish and wildlife flavor.

Response: ADEQ does not have practical implementation procedures to determine whether surface waters are impaired by tainting of the flesh of waterfowl. No change to the rules.

57. *Comment:* We recommend that the narrative bottom deposit standard include, at a minimum, a list of stream characteristics that indicate excessive rates of sedimentation. Data and protocols developed under various wetlands grants and in-house expertise in fluvial processes provide a starting point for articulating an appropriate suite of condition statements.

Response: The draft implementation procedures for the bottom deposit narrative standard include in-stream habitat characteristics indicating excessive rates of sedimentation. As proposed by ADEQ, implementation of the narrative standard involves two broad procedures: 1) bioassessment procedures for determining impairments of aquatic life, and 2) habitat assessment procedures for determining that the cause of an impairment is due to excessive sedimentation. Bioassessment depends upon the collection of benthic macroinvertebrate data and comparison to reference conditions to determine aquatic life impairment. The habitat assessment procedures involve the evaluation of a number of in-stream substrate conditions to determine whether aquatic life impairments are caused by excessive sedimentation or siltation. ADEQ drafted a habitat assessment index that consists of an evaluation of 5 in-stream habitat parameters: riffle habitat quality, extent of riffle habitat, embeddedness in riffles, amount of sediment deposition, and bank stability. These stream characteristics are rated to determine if there is excessive sedimentation in a stream. Thus, the draft implementation procedures for the narrative bottom deposit standard include several physical and biological stream characteristics that may be used to indicate excessive rates of sedimentation in wadeable, perennial streams.

58. *Comment:* Another concern is that the proposed narrative bottom deposit standard lacks any implementation component. It is unclear how ADEQ's § 401 certification program will actually use the subject standard to assure that § 404 permits comply with applicable water quality requirements. We are also unclear about whether water quality assessments pursuant to § 303(d) and § 305(b) would be performed on the basis of the narrative standard. Clarification is needed regarding ADEQ's ability to base § 401 certifications and assessment activities on narrative water qual-

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ity standards. We understand that ADEQ relies on its numeric standards in certifying § 404 permits. If this is the case, then the implication of the proposed revision is significant.

Response: ADEQ developed draft implementation procedures for the narrative bottom deposit standards which address how ADEQ proposes to determine compliance with the narrative standard using bioassessment and habitat assessment procedures. The draft guidance document focuses primarily on how ADEQ will determine compliance with the narrative standard. It does not specifically address how § 401 certifications for § 404 permits will be conducted using the narrative standard. ADEQ agrees that the implementation guidance document should address how the narrative standard can be used in § 401 certification of permits and for assessment purposes.

59. *Comment:* Asarco is not opposed to the development of implementation procedures for narrative standards, but does oppose developing guidance documents outside of the rulemaking process if those guidance documents contain substantive requirements. Under Arizona's Administrative Procedures Act, such an approach is impermissible. Anything that establishes the legal obligations of a party must be put in rule, not guidance. If it is only guidance, it is advisory only, and cannot be binding. ADEQ therefore must either incorporate guidance documents by reference, which means the entire guidance document must go through the rulemaking process, or else incorporate in rule the key concepts of the guidance (those establishing legal duties, stating how compliance will be assessed). It is our belief that core concepts ought to go in rule rather than guidance so that they are more easily accessible to the public. These concepts include, but are not limited to, any numeric standards, translator mechanisms, test method identification, and methods used to assess compliance. We therefore oppose use of the guidance documents referenced in the preamble in any but an advisory capacity. These include the documents relating to bioassessments, bottom deposits, toxicity, and nutrients. We support convening a separate stakeholder process to work on these guidance documents, with the goal of reaching consensus on their contents so that the documents, or their key concepts can be incorporated into rule. It is our understanding, based on discussions regarding the TMDL rule, that ADEQ plans to follow this approach.

Response: ADEQ agrees that implementation procedures for the narrative standards need to be developed through a process involving public participation. ADEQ is committed to initiating a stakeholder process in 2002 to develop implementation procedures for the antidegradation rule as well as the narrative standards for toxics, nutrients, and bottom deposits. ADEQ agrees that implementation procedures must adopted by rule before narrative standards can be used for water quality assessment purposes and for § 303(d) listing purposes. ADEQ takes no position at this time on whether entire guidance documents or only key concepts of narrative standards need to be incorporated into rule. ADEQ does not agree that its current narrative standards cannot be enforced or that the agency is somehow barred from implementing or enforcing narrative water quality standards that are in rule (for example, through the NPDES permit program). The narrative standards are effective law and ADEQ can use its current guidance to determine compliance with them. ADEQ agrees only that it cannot list a surface water as impaired on the § 303(d) list in the absence of specific implementation procedures specifically identifying the objective basis for determining that a violation exists. It does not mean that ADEQ cannot make compliance determinations or implement the narrative standards through NPDES permits.

60. *Comment:* In the second sentence of R18-11-108(B), I urge that the discharge of oil or gasoline be considered a violation if the cumulative amount is hazardous.

Response: ADEQ disagrees. R18-11-108(B) is the narrative standard that requires that surface waters be free from oil and grease, and other pollutants that float as debris, foam, or scum, or that cause a film or iridescent appearance on the surface of the water, or that cause a deposit on a shoreline, bank, or aquatic vegetation. The second sentence in the narrative standard clarifies that the discharge of lubricating oil or gasoline associated with the normal operation of a recreational watercraft is not considered to be a violation of the narrative standard. The second sentence is necessary because de minimis discharges of oil or gasoline associated with the normal operation of a boat are common and they should not be interpreted to violate the standard. If the narrative standard were applied that literally, even a de minimis discharge of oil or gasoline that creates a sheen on the surface of water would violate the narrative standard. If the narrative were that strictly interpreted, it would make it impossible to operate recreational watercraft on Arizona surface waters without incurring liability for a water quality standards violation. ADEQ thinks that the second sentence provides an important clarification of the intent of the narrative standard and does not think it is necessary to amend it to address cumulative impacts.

R18-11-109. Numeric Water Quality Standards

61. *Comment:* The current rule at R18-11-109(A) indicates that the water quality standards in Appendix A apply to the surface waters listed in Appendix B. This language is deleted from the rules and we do not find an analogous provision in the proposal that would indicate the function of Appendix A and B.

Response: ADEQ deleted R18-11-109(A) because it is unnecessary and duplicative. R18-11-104(C) states that the numeric water quality criteria to maintain and protect water quality for the designated uses are prescribed in Appendix A, R18-11-109, R18-11-110, and R18-11-112. This subsection of the rule clearly indicates the function of Appendix A. R18-11-104(B) lists the designated uses of surface waters that have been established by the state. The last sentence in R18-11-104(B) indicates the function of Appendix B by stating that the designated uses for specific surface waters are listed in Appendix B. These two subsections together serve the same function as R18-11-109(A) in the current rules.

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62. *Comment:* ADEQ is proposing the same *E. coli* criteria to maintain and protect water quality for both the full-body contact and partial-body contact designated uses. We are supportive of this and are also supportive of a more stringent single sample maximum criterion for *E. coli*. We believe this is appropriate and warranted and agree with ADEQ that conservative approach to public health protection is warranted and justified.

Response: ADEQ agrees. A conservative approach to establishing *E. coli* criteria for surface waters that are used for recreation is prudent public health policy. The revised *E. coli* criteria adequately protect the health of persons who participate in full-body contact and partial-body contact recreation activities in the state's surface waters.

63. *Comment:* We would like to see some clarification regarding temperature and the impact of nonpoint source activity, such as those that modify the landscape and affect the amount of shade for the surface water. We would like to see the footnote 4 relative to temperature amended to say that the exemptions for storm water only applies to storm water that is exempt from consideration under the Clean Water Act.

Response: ADEQ does not know how to clarify the current temperature standard with regard to nonpoint source activities, specifically landscape modifications that affect the amount of shade for a surface water. ADEQ welcomed specific recommendations for changes to the current temperature criteria to address these issues. The current temperature standard is intended to limit thermal discharges that raise the temperature of a receiving surface water. ADEQ did not intend to address land uses and nonpoint source activities that may affect the temperature of a surface water. Also, ADEQ is unsure what is meant by the latter part of the comment that seeks amendment of footnote 4 to clarify that the proposed exemption for storm water discharges applies only to "storm water that is exempt from consideration under the Clean Water Act." It is not necessary to say that the surface water quality standards do not apply to waters that are exempt from consideration under the Clean Water Act. Also, the applicability section of the rules in R18-11-102 addresses this Clean Water Act jurisdictional issue. The temperature standard in R18-11-109 applies only to thermal discharges to surface waters that are subject to regulation under the water quality standards program. Thus, the exemption in footnote 4 is intended to apply to storm water discharges to all surface waters that are subject to regulation under the Clean Water Act.

64. *Comment:* Future repeal of the turbidity standard may be appropriate, but it does not appear that ADEQ is ready with adequate replacement measures to ensure protection of aquatic life. High concentrations of suspended solids can kill fish, impact their rate of growth and reproduction, and make them more susceptible to disease, among many other impacts. We are not convinced that the proposed criteria will adequately protect them.

Response: ADEQ adopted numeric suspended sediment concentration criteria (SSC) to replace the current turbidity criteria that are established to protect aquatic life. The SSC criteria are established primarily to protect fish populations [See R18-11-109(D)]. Also, ADEQ is revising the narrative bottom deposits standard to focus it on the protection of aquatic life. Together, these numeric and narrative water quality standards will adequately protect aquatic life.

65. *Comment:* The Arizona Mining Association strongly supports ADEQ's proposal to delete the current numeric turbidity criteria in R18-11-109(F). As noted in ADEQ's preamble, the current numeric criteria are expressed as single sample maximum concentrations, and therefore exceedances may occur after nearly every storm event due to natural turbidity increases. Such exceedances clearly are not indicative of any type of impairment. Data from turbidity testing also is of suspect reliability and should not be used for compliance purposes.

Response: The current turbidity criteria are not scientifically defensible and should be repealed for the reasons stated in the preamble.

66. *Comment:* As ADEQ outlined in the preamble, there is no valid scientific basis for the current turbidity standard, particularly in an arid environment where infrequent storm events naturally will carry heavy sediment loads into waters. The standard is therefore of dubious validity and also inappropriate for many waters in the state. The proposed new suspended sediment standard is more defensible. Asarco therefore supports removal of the numeric turbidity standard.

Response: ADEQ agrees. The final rules do not include turbidity criteria.

67. *Comment:* We oppose the elimination of the numeric turbidity standard. Turbidity is a serious problem in Arizona's waters and we believe it is necessary that such a pollutant have a clear, numeric standard. Narrative water quality standards serve an important purpose, but they are also easier to violate. Due to the bright line rule of numeric water quality standards, it is immediately apparent when a numeric water quality standard has been violated. Because changing the standard to a narrative standard may result in the delisting of waters from the § 303(d) list, it is imperative that ADEQ first complete a bioassessment and consult credible scientific data before changing the turbidity standard. Failure to do so may be an abuse of discretion.

Response: ADEQ agrees that excessive sedimentation is a serious water quality problem in Arizona. Excessive sedimentation has been identified as one of the nation's most significant causes of water quality impairment in the National Water Quality Inventory. Also, turbidity is identified as the most common stressor in Arizona streams in the Arizona's Clean Water Act § 305(b) Report 2000. However, while ADEQ acknowledges that excessive sedimentation is a serious problem, ADEQ cannot defend the current numeric criteria for turbidity because they are not correlated to impairments of aquatic life designated uses. The preamble to this final rule explains the scientific and technical inadequacies of the current turbidity criteria. It is true that the current turbidity criteria have the advantage of being "bright-line" numeric criteria and it is easy to determine when the criteria are exceeded. However, neither advantage

is an argument for the continued maintenance of scientifically indefensible criteria. ADEQ recognizes the utility of having “bright line” numeric criteria. For this reason, ADEQ adopted a numeric suspended sediment concentration criterion to replace the turbidity criteria in the final rules.

More research needs to be done on excessive sedimentation and aquatic life impairments. Research needs to be done on appropriate methods for determining thresholds between “naturally-occurring” sedimentation and detrimental, human-induced, excess sedimentation. ADEQ needs to identify appropriate criteria development methodologies and sedimentation end points. A more extensive literature base on sedimentation needs to be developed. Also, ADEQ should investigate other approaches to developing water quality standards to prevent excessive sedimentation. In particular, ADEQ should investigate the potential of biological criteria and the use of bioassessment and habitat assessment procedures to address sedimentation problems. ADEQ is taking the first steps in this direction with the development of the narrative bottom deposits standard and its implementation procedures. Recent ADEQ research in fluvial geomorphology and the techniques of applied river morphology holds promise for the future development of appropriate physical integrity criteria for addressing problems of excessive sedimentation.

68. *Comment:* While the Arizona Mining Association (AMA) does not necessarily disagree with ADEQ’s proposal to use *E. coli* criteria in lieu of fecal coliform criteria, AMA does not agree that the geometric mean criteria of 126 cfu / 100 ml should apply to ephemeral waters with the PBC use. Because such waters only flow in response to highly variable precipitation events, the use of a geometric mean to calculate compliance is not appropriate. Moreover, AMA questions the application of the geometric mean criteria to storm water discharges.

Response: ADEQ did not consider flow regimes when establishing the *E. coli* criteria. Because of the lack of empirical data to support the adoption of numeric criteria for the partial-body contact designated use based on likely exposure pathways (e.g., incidental exposure, dermal contact), ADEQ adopted water quality criteria for the PBC designated use that are considered to be adequately protective of the health of persons who engage in full-body contact recreation. These criteria are expressed as a geometric mean value and single sample maximum concentrations. Both are necessary to determine attainment of the designated use. ADEQ took an admittedly conservative approach to human health protection when establishing the PBC criteria. ADEQ is confident that the *E. coli* criteria for PBC will adequately protect human health. Some may consider the criteria to be overprotective since the PBC criteria are equivalent to criteria that would be considered adequately protective for the FBC designated use. However, in the absence of human health effects data to support technically defensible PBC criteria, ADEQ thinks it is prudent to err on the side of caution with regard to human health protection. ADEQ does not have confidence that a single sample maximum criterion alone provide an adequate level of human health protection for the PBC designated use. No change to the rules.

69. *Comment:* The numeric water quality standard for *E. coli* should not apply to storm water discharges. The Pima County Department of Environmental Quality recommends adding a footnote as was done for temperature.

Response: ADEQ believes that *E. coli* criteria to protect human health should apply to all surface waters, including those that receive storm water discharges. No change to the rules.

70. *Comment:* AMA disagrees with ADEQ’s proposal to change the geometric mean criteria from the EPA-recommended five samples over a 30-day period to a simple requirement that at least four samples be used to calculate the geometric mean concentration. ADEQ’s rationale for this change is that it is difficult to collect five samples within 30 days at any site as part of its ambient surface water quality monitoring program. Under the alternative approach, ADEQ plans to determine compliance based on four quarterly samples taken over an entire year. However, both ADEQ and EPA have recognized that more frequent sampling for bacteria yields more accurate results. ADEQ also recognizes that it routinely samples several designated swimming areas on a frequent enough basis to use the five-samples over a 30-day period requirement. Because these are the types of waters to which the standard is most applicable, the retention of the 30-day averaging period is necessary to avoid inappropriate determinations or allegations of exceedances of the geometric mean standard in waters that are only occasionally used for swimming or related recreational use.

Response: ADEQ disagrees and did not include a reference to a 30-day averaging period in the final rule. EPA has explained in its Draft Implementation Guidance for the Ambient Water Quality Criteria for Bacteria-1986 that the reference to a minimum of five samples in a 30-day period in EPA’s 1986 criteria recommendations for bacteria “is for accuracy purposes only” [See p. 21 of the Draft Implementation Guidance]. It is true that EPA and ADEQ agree that more frequent sampling for bacteria yields more accurate results when determining a geometric mean. However, EPA clarified in its implementation guidance that it is the geometric mean of the samples collected in conjunction with the single sample maximum standard that determines attainment of the recommended *E. coli* criteria. In other words, a 30-day averaging period is not a critical or required element of EPA’s recommended bacteria criteria. For this reason, ADEQ amended the bacteria standards and removed the reference to a 30-day geometric mean. The adopted *E. coli* standard is expressed as a geometric mean of samples collected (four-sample minimum).

ADEQ and EPA recommend that full-body contact recreational areas be frequently monitored throughout the swimming season, particularly surface waters that are designated bathing areas, to ensure that human health is adequately protected. For example, there are some heavily-used designated swimming areas in Arizona (such as Slide Rock State Park on Oak Creek or the lower Salt River below Stewart Mountain Dam) where frequent water quality monitoring for bacteria is recommended in the summer. Where frequent monitoring for bacteria occurs (for example, daily mon-

itoring), a geometric mean of the samples that are collected within a 30-day averaging period is appropriate. However, in surface waters that are infrequently used for full-body contact recreation, less frequent water quality monitoring takes place and the use of a 30-day averaging period is impractical. For example, ADEQ conducts monitoring of surface waters for bacteria as part of its ambient surface water quality monitoring program. ADEQ typically monitors quarterly for bacteria at sampling sites. Under the current standards, ADEQ is not able to determine compliance with the bacterial water quality standard that is expressed as a 30-day geometric mean (five-sample minimum). ADEQ does not take five samples within 30 days at any site as part of its ambient surface water quality monitoring program.

Under the final rule, compliance with the *E. coli* standard is based on a four-sample minimum geometric mean. The bacterial water quality standard is expressed as a geometric mean concentration calculated from a minimum of four samples to provide more regulatory flexibility. ADEQ is able to determine compliance with the bacteria standards based on the results of four quarterly samples that are taken over the course of the water year as part of its routine surface water quality monitoring program. However, the expression of the *E. coli* standard in this way does not preclude more frequent water quality monitoring at heavily-used bathing areas like Slide Rock State Park or the use of 30-day averaging periods in NPDES permits. The expression of the standard as a four-sample geometric mean allows compliance determinations with bacterial water quality standards in the vast majority of surface waters that are infrequently used for full-body recreation.

71. *Comment:* We are concerned about the proposed revision which repeals the 30-day averaging period for the *E. coli* standard at R18-11-109(A). Since there is no defined time-frame, it is unclear whether the samples are to be averaged from five samples gathered in a week, a month, or a longer time-frame. This approach may be less protective of public health since the number of exceedances is proportional to the time-frame during which the samples are gathered. For example, if five samples are averaged over a 90-day period, 1/3 of the exceedances that are measured using five samples in 30 days would be found. EPA based the bacteriological standards on a statistically sufficient number of samples (generally not less than five samples equally spaced over a 30-day period). See Ambient Water Quality Criteria for Bacteria -1986 (EPA440 / 5-84-002). EPA will require that ADEQ provide the statistical basis for the proposed bacteriological standard and a demonstration that the standard is protective of public health. The 1986 guidance does allow the State to determine different confidence levels based on the frequency of use for recreational waters for waters of the state and apply the appropriate confidence limits to derive applicable standards to each category.

Response: ADEQ's *E. coli* criteria to protect the FBC and PBC designated uses are consistent with EPA's criteria recommendations for bacteria. The state-adopted standards include both geometric mean concentration and single sample maximum criteria for *E. coli*. Also, the state-adopted geometric mean criteria for *E. coli* bacteria for both the FBC and PBC designated uses are the same as EPA's criteria recommendations for bathing beaches (i.e., 126 per 100 ml). It is true that EPA's Quality Criteria for Water, 1986 document (the "Gold Book") states that the geometric mean criterion must be based on "a statistically significant number of samples (*generally* not less than five samples equally spaced over a 30-day period)," [emphasis added]. However, ADEQ does not agree that the state's bacteria standard *must* be based on a five-sample minimum or a 30-day averaging period. In fact, the chart in the Gold Book that actually presents EPA's criteria recommendations for bacteria does not include a reference to a 30-day averaging period. The geometric mean criteria are described as a "steady-state geometric mean indicator density." ADEQ's conclusion that a 30-day average (five-sample minimum) is not required is supported by EPA's recent Draft Implementation Guidance for Ambient Water for Bacteria - 1986 which states, in relevant part on page 21:

The Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports and Electronic Updates requires 1) the geometric mean of the samples taken to not exceed the criterion **and** 2) the single sample maximum to be met for a water body to be fully supporting its primary contact recreation use....In some situations, there has been a misconception regarding the first required element for assessing the status of the primary contact recreation use. *Some States have mistakenly interpreted the water quality criteria as requiring a minimum number of samples in order to determine attainment of the water quality criteria. The confusion may have arisen because the water quality criteria recommend a geometric mean based on five samples taken over a 30-day period. The minimum number of samples used in the 1986 water quality criteria for bacteria is for accuracy purposes only; clearly, more frequent sampling yields more accurate results when determining a the geometric mean. It is the geometric mean of the samples collected in conjunction with the a single sample maximum that determines attainment of the numeric water quality criteria, regardless of the number collected.* This interpretation encourages the collection and use of data and is what has always been intended. [emphasis added]

ADEQ's expression of the bacteria standards is consistent with EPA's recent bacteria implementation guidance. If anything, ADEQ's approach to public health protection is more protective because it applies EPA's geometric mean criteria recommendations for bacteria statewide to all surface waters, even to surface waters that do not have a full-body contact recreation designated use. ADEQ disagrees that it is required to provide the statistical basis for the state-adopted *E. coli* criteria when ADEQ adopts criteria that are consistent with EPA's § 304(a) criteria recommendations for bacteria.

72. *Comment:* The Arizona Mining Association supports ADEQ's proposal to clarify that the maximum increase in temperature standard does not apply to storm water discharges. This proposed clarification is appropriate because of the highly variable nature of storm water discharges.

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Response: ADEQ's revision of the temperature rule to clarify that the maximum increase in temperature standard does not apply to storm water discharges is a practical recognition that there are no technologies currently available to control increases in water temperature that may result from the collection of storm water runoff that flows over parking lots, roads, and other structures in the built environment. ADEQ believes that the revision to footnote 4 is reasonable given the practical realities of controlling storm water runoff, especially in an arid environment where the vast majority of streams are intermittent or ephemeral waters and the flow in them consists of storm water runoff.

73. *Comment:* We appreciate ADEQ's concerns regarding the temperature of storm water. However we suggest that ADEQ revise footnote 4 to read, "the maximum increase in temperature standard does not apply to storm water discharges excluded from regulation under the Clean Water Act." The revision we propose ensures that this clarification to the temperature standard will not create a loophole in which permittees may violate the temperature requirements in their storm water permits.

Response: ADEQ disagrees. The exemption for storm water discharges in the footnote is intended to apply to discharges to surface waters that are subject to regulation under the Clean Water Act.

74. *Comment:* We recommend that ADEQ not adopt the revision to R18-11-109 that would render the temperature change criteria inapplicable to storm water discharges. Storm water runoff heated by contact with pavement and similar surfaces has been shown to have severe impacts on aquatic biota. Temperature increases in surface waters due to heated storm water runoff result in direct biological impacts

(For example, disruption of aquatic life cycles, increased levels of pathogenic bacteria, and blooms of less desirable forms of algae such as blue-green algae), and to changes in water quality conditions which lead to biological impacts (e.g. reduced levels of dissolved oxygen which are insufficient for aquatic life survival, and increased metal and hydrocarbon solubility which are toxic to aquatic life). Reductions in dissolved oxygen levels due to heated storm water runoff raises particular concerns for EPA because the state's 1996 § 305(b) report lists dissolved oxygen as a stressor to 333 stream miles in Arizona. Because of the inverse relationship between temperature and dissolved oxygen, we are concerned that the revision under consideration will result in further impairment of Arizona's surface waters due to low DO. In addition to lower DO resulting from thermal discharges, effects to lower trophic levels may also result.

Response: The temperature standard in R18-11-109 limits increases in temperature due to discharge. The standard is intended to regulate the thermal component from a point source discharge that is controllable. For example, the standard would apply to the discharge of cooling water from a power plant where heat is added to cooling water that is discharged to a surface water. The temperature standard limits the discharge of wastewater from an industrial or manufacturing facility where there is a thermal component of the discharge that can be controlled. The temperature of storm water runoff that is heated by contact with surfaces in an urban environment cannot be practicably controlled. ADEQ is not aware of best management practices that can be used to control increases in the temperature of storm water runoff nor is ADEQ convinced that controlling the temperature of storm water runoff is necessary to assure the protection and propagation of a balanced, indigenous population of fish and wildlife in and on the surface waters into which discharges of storm water are made. In most cases in Arizona (for example, storm water discharges to ephemeral waters), the receiving water consists entirely of storm water runoff. It is difficult to see how a limit on the increase in temperature can be applied in such situations.

ADEQ agrees that there is a relationship between water temperature and dissolved oxygen concentrations. However, there is no scientific basis for the comments that storm water discharges reduce levels of dissolved oxygen to levels that are insufficient to support aquatic life or that the proposed revision will adversely affect surface waters that are identified as impaired in the § 305(b) report because of low dissolved oxygen levels.

75. *Comment:* The requirement to use a specific procedure to do an analysis seems to be a new direction that ADEQ is taking. Total suspended solids methods approved by the U.S. EPA and presented in Standard Methods have been used for many years without an apparent problem. The requirement to use the Suspended Sediment Concentration (SSC) analytical method instead of the TSS method is probably not justifiable given the conditions in Arizona and the circumstance that the water quality criteria applies. A comparison of the analytical procedures of TSS and SSC reveals that the SSC method will measure more of the fine colloidal material and particularly the heavy sand particles. The colloidal component represents an insignificant fraction of the weight of the suspended solids. The draft water quality standards states that the SSC criterion applies to a surface water that is at or near base flow and does not apply during or soon after a precipitation event. If only base flow samples are analyzed, sand-sized material would not be present in the water sample. An Arizona stream at base flow conditions would not be able to transport sand-sized material in the water column. There is no advantage to using the SSC method for suspended solids analysis. If the SSC method is superior to the TSS method, why is a four-sample minimum required? Will this four-sample minimum also be reflected in the NPDES permits? What are the minimum and maximum time between each of the four compliance samples? Does the SSC method carry EPA approval?

Response: ADEQ expressed the sediment standard as a suspended sediment concentration (SSC) rather than total suspended solids for several reasons. First, the SSC analytical method, ASTM D 3977-97, Standard Test Method for Determining Sediment Concentration in Water Samples, is the U. S. Geological Survey (USGS) standard method for determining concentrations of suspended material in surface water samples. This method is used by all USGS sediment laboratories and by cooperating laboratories certified to provide suspended sediment data to USGS. Second, the

SSC method is described as the most accurate way to measure the total amount of suspended material in a water sample collected from a surface water. Recent studies on the accuracy of the SSC analytical method by ASTM and the U.S. Geological Survey Branch of Quality Systems (Gordon and others, 2000) have shown that SSC analysis represents a more accurate measure of the concentration of suspended sediment in a surface water sample. Other measurements, such as total suspended solids and turbidity, may be less expensive to collect or analyze but they result in unacceptably large errors and they are fundamentally unreliable. Third, SSC analysis is more reliable. Differences between total suspended solids (TSS) and suspended sediment concentration analyses were investigated recently by the U.S. Geological Survey [See Gray, John R. et. al, Comparability of Suspended Sediment Concentration and Total Suspended Solids Data, Water Resources Investigation Report 00-4191, U. S. Department of the Interior, U.S. Geological Survey, August, 2000]. The USGS investigated differences in the data produced by TSS and SSC analyses by studying 3,235 paired TSS and SSC samples and 14,466 data pairs from the USGS NWIS database. The USGS concluded from the statistical analyses of the paired samples that the data produced by the SSC technique is more reliable than data produced by TSS analysis. The conclusions of this USGS study can be summarized as follows:

- TSS analysis is normally performed on an aliquot of the original water sample. The difficulty in withdrawing an aliquot from a sample that truly represents suspended material concentration leads to inherent variability in the measurement. By contrast SSC analysis is performed on an entire water sample, thus measuring the entire sediment mass in the sample. The analytical procedures for SSC and TSS differ and at times produce considerably different results, particularly when sand-size material composes a significant percentage of the sediment in a sample.
- TSS methods and equipment differ among various laboratories whereas SSC methods and equipment used by USGS sediment laboratories are consistent and are quality assured by the National Sediment Laboratory Quality Assurance Program.
- Results of the TSS analytical method tend to produce data that are negatively biased by 25% to 34% with respect to SSC analyses collected at the same time and can vary widely at different flows at a given site. The biased TSS data can result in errors in sediment load computations of several orders of magnitude.

ADEQ expressed the SSC standard as a geometric mean (four-sample minimum) because the standard is intended to be a chronic criterion. The standard is intended to prevent adverse effects on fish from long-term exposures to elevated levels of suspended sediment in water. Fish should be adequately protected if the *average* suspended sediment concentration in a surface water is below 80 mg / L. Compliance with the standard cannot be determined from instantaneous measurements of the suspended sediment concentration (e.g., grab samples). The standard is not designed to prevent acute or short-term adverse effects of exposure to suspended sediment. An acute standard for suspended sediment would be much higher than 80 mg / L.

ADEQ does not know how the new suspended sediment concentration standard will be translated into water quality-based discharge limitations in NPDES permits. It can be said that the new SSC standard will have no effect on technology-based discharge limits in NPDES permits that are currently expressed as total suspended solids. It is possible that another water quality-based discharge limitation designed to achieve compliance with the new SSC standard may be placed in NPDES permits. However, the establishment of water quality-based discharge limitations and monitoring requirements is up to the NPDES permit-issuing authority. The SSC method is not currently listed in 40 CFR, Part 136 as an EPA-approved method. However, the State Laboratory currently is working to approve the SSC method.

76. *Comment:* While we believe that *E. coli* may be a better indicator of microbiological water quality, it is important to recognize that not every wastewater treatment facility will be able to immediately change over to test for *E. coli* as opposed to fecal coliform. As a result, we suggest that there be a one-year lay-over period during which facilities would test for both fecal coliform and *E. coli*. This dual testing will also likely assist ADEQ in determining the appropriate standards for *E. coli* in Arizona. The dual testing will further ensure that some bacterial standard is in place at all times. Furthermore, ADEQ proposes a single sample maximum for full-body contact at 235 cfu / 100 ml and 576 cfu / 100 ml for partial-body contact. We oppose the large disparity between these two standards. It is clear that partial-body contact might result in full exposure, particularly for children who may not appreciate the difference between partial and full-body contact designations. In waters where children may swim, we recommend that ADEQ impose the same bacterial standard for partial and full-body contact. Finally, the Center for Law in the Public Interest is concerned that the bacterial monitoring requirement discussed on p. 1851 of the Notice of Proposed Rulemaking are less stringent than what is currently required. Reducing the amount of monitoring, particularly for such an important standard, would likely violate the antibacksliding provision of the Clean Water Act.

Response: ADEQ has the authority to develop schedules of compliance for new and revised water quality standards to provide enough time for wastewater treatment facilities to transition to new regulatory requirements [See R18-11-121]. ADEQ disagrees that the proposed bacteria standards are not adequately protective because of the disparity in the single sample maximum criteria for full-body contact and partial-body contact recreation. First, ADEQ adopted the same geometric mean criteria to protect both the FBC and PBC designated uses. The state-adopted geometric mean criterion is identical to EPA's criteria recommendations to protect human health. The proposed single sample maximum standard of 235 cfu / 100 ml for the full-body contact designated use is consistent with the most stringent EPA criteria recommendation for bacteria to protect public health at bathing beaches. ADEQ disagrees that the single sample maximum criterion of 576 cfu / 100 ml to maintain water quality for the partial-body contact recreation use is inadequate. The proposed single sample maximum criterion for the partial-body contact recreation designated use is based on EPA's criteria recommendations to protect human health in waters that are infrequently used for swimming.

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ADEQ essentially adopted full-body contact recreation criteria for bacteria to protect the PBC designated use. ADEQ thinks that bacteria criteria that are designed to protect swimmers in surface waters that are infrequently used for swimming are appropriate to maintain and protect surface waters with the partial-body contact designated use. It should be noted that EPA does not make any criteria recommendations for bacteria to maintain and protect water quality for secondary or partial-body contact recreation. Moreover, EPA's criteria recommendations for bacteria to protect human health do not make distinctions between adults and children.

Finally, the state's revision of the bacteria standards to be consistent with EPA's national criteria recommendations does not violate the provisions of the Clean Water Act related to anti-backsliding. Anti-backsliding relates to the establishment of NPDES permit conditions and does not apply to the modification or revision of the surface water quality standards.

77. Comment: We are concerned that the proposed revision of the narrative standard for suspended solids and excessive sedimentation will further diminish ADEQ's ability to maintain and restore the integrity of waters of the United States in Arizona. ADEQ's primary regulatory authority for protecting water quality is its § 401 certification of federal permits and licenses, including § 402 and § 404 permits. In the past, the numeric criteria for turbidity was used as a basis for either denying or conditioning water quality certifications of § 404 permits. This standard applied to ephemeral as well as perennial and effluent dominated waters. During the last triennial review of water quality standards, ADEQ restricted the application of the numeric turbidity standard to perennial and effluent dominated waters, thereby, removing this standards from the vast majority of tributaries in the state. We note that virtually all of the

§ 404 permits issued in Arizona affect ephemeral or intermittent tributaries, not perennial streams. The current proposal would repeal the numeric criteria for turbidity and replace it with a revised narrative standard that addresses suspended and settleable solids. We understand that this narrative standard would apply to all tributaries, not just perennial and effluent dominated waters. However, the revised narrative standard lacks a sufficient degree of specificity to be effective in maintaining the applicable designated uses. We believe that adoption of the narrative standard addressing suspended and settleable solids does not justify the repeal of the numeric criteria for turbidity. The presence of suspended and settleable solids obviously influences turbidity, but turbidity is distinct from those criteria. Turbidity's effects differ from the effects of suspended and settleable solids and turbidity can impair a waterbody's uses where suspended and settleable solids criteria limits are met. Moreover, turbidity's effects can be substantial and the criteria can be a very useful indicator of a water body's biotic condition [citations to literature omitted]. We further recommend retention of the numeric turbidity criteria because, in addition to its utility as noted above, the parameter is relatively inexpensive to measure and can be relatively easily collected remotely as a continuous reading.

Response: ADEQ has concluded that the current numeric turbidity criteria in the surface water quality standards rules are scientifically indefensible. ADEQ's reasons for repealing the current turbidity criteria are explained at length in the preamble and they will not be repeated here. ADEQ stands by its decision to repeal the turbidity standards on the previously-stated grounds. EPA is correct that numeric turbidity criteria have been used in § 401 certifications of § 404 and § 402 permits in the past. However, the past use of the turbidity criteria in § 401 water quality certifications does not justify the maintenance of scientifically indefensible turbidity criteria in the surface water quality standards rules. Moreover, ADEQ proposes to adopt a numeric criterion for suspended sediment concentration (SSC) that can function as a replacement for the numeric turbidity criteria that are being repealed. The new SSC criterion can be used for § 401 certification purposes. ADEQ agrees with EPA that suspended and settleable solids are important water quality parameters. ADEQ has established both numeric and narrative criteria to regulate these parameters in Arizona surface waters. However, ADEQ does not agree that turbidity should be used as a surrogate indicator to address excessive sedimentation in surface waters. Finally, it should be noted that EPA's own § 304(a) criteria recommendations for suspended and settleable solids in the Quality Criteria for Water, 1986 do not include numeric criteria for turbidity.

78. Comment: The U.S. Fish and Wildlife Service has asked for specific and frequent monitoring of oil and grease discharges. It is EPA's understanding that the state will adopt the EPA 1986 Quality Criteria for Water as implementation guidance for the oil and grease narrative water quality standard. We request that the state provide a schedule for adoption of this implementation guidance.

Response: ADEQ intends to address implementation guidances for narrative standards in a stakeholder process to be initiated in 2002. ADEQ will initially focus on the narrative toxics, nutrient, and bottom deposits narrative standards as well as implementation procedures for antidegradation. The implementation guidance for oil and grease, while important, is a lower priority. ADEQ will not provide a schedule for adoption of an implementation guidance for oil and grease because ADEQ does not know how long it will take to complete the development of higher priority implementation guidance documents. In the interim, ADEQ will rely on EPA's Gold Book criteria guidance to implement the oil and grease narrative standard.

R18-11-112. Unique Waters

79. Comment: One of our primary concerns about the proposed rule is the change in the unique waters process and the limitations on what can be designated a unique water. We absolutely object to limiting unique waters designation to only perennial streams and we object to ADEQ's proposal to make the nomination process more difficult for the general public.

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Response: The universe of “outstanding state resource waters” or “unique waters” is necessarily a limited one. All surface waters cannot be unique waters or outstanding state resource waters. Outstanding state resource waters, or unique waters, are defined by comparison to other surface waters in the state. In general, unique water classification is reserved for a relatively small number of the state’s surface waters. That is, the truly exceptional and outstandingly remarkable surface waters in the state. It is estimated that 96% of the state’s surface waters in the state are intermittent or ephemeral waters [See Table 2 in The Status of Water Quality in Arizona, Clean Water Act Section § 305(b) Report 2000]. Intermittent and ephemeral waters represent the average condition or the typical surface water in Arizona. The unique or exceptional condition is represented by the small number of surface waters that are perennial (approximately 5%). ADEQ believes it is reasonable to limit eligibility for unique water classification to perennial waters.

ADEQ disagrees that it has made the unique waters nomination process more difficult for the general public. While ADEQ added new eligibility requirements and restricted formal consideration of unique water nominations to the triennial review process, these changes do not make the nomination process more burdensome. ADEQ did not significantly change the information requirements for unique water nominations in the final rule. It is true that the preamble in the Notice of Proposed Rulemaking included an extensive discussion of the types of information that ADEQ would require for a unique water nomination. ADEQ discussed the use of an evaluation methodology developed by the Arizona River Assessment Project (ARAP) as a model for evaluating unique water nominations in the preamble. While ADEQ believes that the ARAP methodology has merit, ADEQ reconsidered the imposition of highly detailed information requirements for unique water nominations after considering the public comments addressing this issue. ADEQ is persuaded that highly detailed information requirements should not be prescribed in the rule. The information requirements for nominations prescribed in the final rule are not significantly different from the requirements that are in the current rule.

There are new requirements to demonstrate that a surface water is perennial and in a “free-flowing condition.” However, ADEQ does not think these new eligibility requirements impose unreasonable burdens on persons who wish to nominate a surface water for unique water classification. The unique waters discussion that ADEQ provides in the preamble to the Notice of Final Rulemaking is intended to provide guidance to the public regarding a unique water nomination. ADEQ would like to emphasize that the preamble discussion does not prescribe information requirements for unique water nominations.

80. *Comment:* We urge ADEQ to look at developing better coordination with the Arizona Department of Water Resources (ADWR) relative to the unique waters process. Ground water pumping has the potential to significantly impact surface water quality and in some instances totally de-water streams. It is inappropriate to ignore the reduction of water quantity and its impact on water quality. ADEQ and ADWR should coordinate and make every attempt to ensure that our surface waters continue to exist and continue to meet high standards for water quality.

Response: ADEQ has no authority to regulate ground water pumping that may reduce flows in surface waters. In the absence of specific statutory authority, ADEQ cannot impose minimum in-stream flow requirements for surface waters through the unique waters program. ADEQ agrees that the de-watering of the state’s surface waters that results from groundwater pumping and surface water impoundment and diversion is a critical water quality management issue. However, ADEQ cannot address this issue indirectly through agency interpretations of its antidegradation rule or surface water quality standards. This issue must be addressed legislatively before ADEQ can address water quantity issues and regulate groundwater withdrawals or other hydrological modifications for water quality purposes.

81. *Comment:* During this triennial review, the Arizona Department of Environmental Quality received 37 nominations for unique water designation. In the proposed rule, ADEQ is proposing to add 10 stream reaches to the list of unique waters. They include the following: Lee Valley Creek, Bear Wallow Creek, North Fork of Bear Wallow Creek, South Fork of Bear Wallow Creek, Snake Creek, Stinky Creek, Hayground Creek, West Fork of the Black River, Upper Cienega Creek, and KP / Cienega Creek. We support the designation of these streams as unique waters, but believe that there are several others that should be added, especially Lower Haunted Canyon and Lower Pinto Creek. We believe both of these streams possess qualities which qualify them as unique waters.

Response: ADEQ classified nine of the ten streams that it formally proposed for unique water classification as unique waters in the final rules. ADEQ did not classify the West Fork of the Black River as a unique water because it is identified as an impaired water on Arizona’s § 303(d) list. For the reasons stated in the preamble to the Notice of Final Rulemaking and in the responses to comments in this responsiveness summary, ADEQ did not classify Lower Haunted Canyon and Lower Pinto Creek as unique waters.

82. *Comment:* Pinto Creek, located east of Superior is nearly 36 miles long, and has several major tributaries including Powers Gulch, Haunted Canyon, the West Fork of Pinto Creek, Horrel Creek, Willow Spring Creek and Campaign Creek. An eight-mile perennial section of Lower Pinto Creek has been included in a study of rivers and streams potentially eligible for inclusion in the national Wild and Scenic Rivers System. Pinto Creek contains a thriving cottonwood-willow community and several species of fish, including the desert sucker. Its lush and diverse riparian vegetation provides important habitat for breeding neotropical birds. We strongly support classification of Lower Pinto Creek as a unique water and do not believe that the ADEQ should exclude it merely because the stream is water quality-limited for dissolved copper and is listed on Arizona’s § 303(d) list. Development and implementation of the total maximum daily load (TMDL) for copper for that stream is intended to restore the water quality in a degraded surface water to a level that achieves compliance with the applicable water quality standards. A unique waters designation for Lower Pinto Creek would provide an additional incentive for assuring that the standard is achieved and maintained in

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the future. We also believe that Pinto Creek meets the criteria set forth in the rule and that this surface water is of exceptional ecological significance as outlined in the nomination.

Response: ADEQ disagrees that surface waters that are identified as water quality-limited and are listed on Arizona's § 303(d) list should be classified as unique waters. In ADEQ's opinion, surface waters with impaired water quality cannot reasonably be considered to be outstanding state resource waters. Surface water quality should meet or be better than applicable surface water quality standards in order for that surface water to be eligible for classification as a unique water. Exceptional water quality (or water quality that is consistently better than water quality standards has been one of the primary designation criteria for unique waters since the inception of the unique waters program [See Arizona Water Quality Control Council Unique Waters Policy, p. 2 (April 8, 1981)]. ADEQ has consistently stated its position that § 303(d) listing and unique waters classification are fundamentally inconsistent with each other. While ADEQ agrees that Lower Pinto Creek has many outstanding attributes, ADEQ did not classify it as a unique water because it is identified as water quality-limited for dissolved copper.

83. *Comment:* We are pleased with your decision relative to Pinto Creek and Haunted Canyon as it relates to unique waters designation. It is a sound decision based on irrefutable fact and applied reasoning. More importantly, however, is the criteria you are recommending for future nominations and recommendations. It is apparent a great deal of thought and consideration was spent in developing these standards and you and your staff should be congratulated for their creation. The Southern Gila County Economic Development Corporation is supportive of your decision to delist Pinto Creek and Haunted Canyon Creek and sincerely hopes that ADEQ does not change its mind on either stream.

Response: For the reasons that are stated in the preamble to the Notice of Final Rulemaking, ADEQ decided not to classify Pinto Creek or Haunted Canyon Creek as unique waters.

84. *Comment:* I applaud you for not proposing Lower Haunted Canyon and Pinto Creek as unique waters. You made the right decision based on good science. The People for the West - Globe Miami support decisions made on good science. We feel that decisions based on bad science manipulated to serve a specific agenda is not healthy for the environment or species (humans included). We ask that you continue making your decisions based on good science.

Response: For the reasons that are stated in the preamble to the Notice of Final Rulemaking, ADEQ decided not to classify Pinto Creek or Haunted Canyon Creek as unique waters.

85. *Comment:* We strongly support the classification of Lower Haunted Canyon as a unique water. The stream in Lower Haunted Canyon originates in the Superstition Wilderness and flows into Pinto Creek. A forest of Arizona cypress, alder, walnut, ash and sycamores shade its banks. Birds and other wildlife find crucial watering, nesting, and breeding habitat in the cool, dense streamside. ADEQ says Lower Haunted Canyon does not meet the criteria for exceptional recreational or ecological significance. We disagree. It is inappropriate to measure the importance of an area for recreation merely by looking at how many people visit it. A water body can have exceptional recreational significance for relatively few as well as for many. Some place with unique attributes do not allow access by large numbers, but by more individuals and small groups. Such unique waters with small current visitation are nonetheless worthy of preservation under unique waters. Lower Haunted Canyon is such an area and is an exceptional recreational resource because it is remote. Lower Haunted Canyon is unique ecologically as well. It provides suitable habitat for the Gila topminnow and Gila chub. Arizona Game and Fish suggested that a unique water designation might impair its ability to manage the resource and limit its options. Frankly, this is pretty weak reasoning for opposing the nomination. We fail to see the justification for this comment by Game and Fish and do not think that the ADEQ should give it significant consideration. The ADEQ fails to consider the presence of several species in considering whether or not to classify this stream, including the Arizona toad (endangered candidate). The Arizona toad has been sighted in lower Powers Gulch immediately above its confluence with the nominated lower Haunted Canyon. We ask that ADEQ classify Lower Haunted Canyon as a unique water in the final rule.

Response: ADEQ did not classify Lower Haunted Canyon as a unique water for the reasons set out in the preamble. ADEQ agrees that Lower Haunted Canyon is a valuable surface water resource that is ecologically significant as a perennial desert stream. However, ADEQ does not agree that the stream possesses the outstandingly remarkable and unique attributes to qualify it as one of Arizona's outstanding state resource waters of exceptional ecological significance. Lower Haunted Canyon may be a significant surface water resource on a local or even a regional scale. However, in ADEQ's best professional judgment, Lower Haunted Canyon does not possess outstanding attributes that set it apart as a surface water of statewide significance. No federally-listed threatened or endangered species are documented to occur in Lower Haunted Canyon, nor is it designated as a critical habitat for a threatened or endangered species. The nomination document notes that both exotic fish species and native fish species are present in Lower Haunted Canyon. The nomination of Lower Haunted Canyon states that the stream provides suitable habitat for the Gila topminnow and Gila chub, two federally-listed endangered species. However, a finding that a surface water may provide suitable habitat is not enough to support a unique waters classification.

Lower Haunted Canyon does not qualify for unique waters classification on the ground that it is of exceptional recreational significance. Public use and access to the stream are limited. The nomination document itself notes that Lower Haunted Canyon is only a "lightly used recreational area." Moreover, an independent evaluation of Lower Haunted Canyon conducted as part of the Arizona Rivers Assessment Project describes Haunted Canyon as being only a limited recreation resource that does not offer a high quality or unique recreational experience within the state when

compared to other surface waters in the state. ADEQ took this independent assessment into consideration when making a decision on whether to classify Lower Haunted Canyon as a unique water on grounds of exceptional recreational significance.

Finally, ADEQ considered the comments of the U.S. Forest Service, the primary federal land management agency for the Tonto National Forest where Lower Haunted Canyon is located. The Tonto National Forest opposed the unique waters classification for Lower Haunted Canyon because it may interfere with mitigation measures agreed to by the U.S. Forest Service, the Carlota Copper Company, U.S. Environmental Protection Agency, Arizona Department of Water Resources, U.S. Army Corps of Engineers, and ADEQ in the final Environmental Impact Statement (EIS) for the Carlota Mine Project. One of the mitigation measures (WR-3 in the final EIS) developed by the Tonto National Forest and agreed to by the Carlota Copper Company is a measure to maintain stream flow in Haunted Canyon. The mitigation measure calls for diverting water from a water supply well field and discharging it to Haunted Canyon. Water quality data provided from the water supply well field indicates that the groundwater has a similar water chemistry to surface water in Haunted Canyon. However, differences in water quality exist that could make it difficult to comply with Tier 3 antidegradation requirements. The classification of Lower Haunted Canyon as a unique water could be counterproductive because it could impair the ability to implement the well field mitigation program designed to preserve existing stream flow in Lower Haunted Canyon. The principal ground for the nomination of Lower Haunted Canyon as a unique water was its outstanding riparian vegetation and its stream hydrology. The maintenance of flow in Lower Haunted Canyon is essential to maintaining this riparian community. A unique waters classification that may interfere with the implementation of a strategy to preserve in-stream flows in Haunted Canyon may do more harm than good. For this reason, ADEQ chose not to propose Lower Haunted Canyon for unique water classification.

86. *Comment:* I nominated Lower Haunted Canyon for consideration as a unique water. ADEQ proposes to reject the nomination because "... Haunted Canyon does not possess attributes to set it apart as a surface water of statewide significance."

I believe that ADEQ did not properly consider the parts of my nomination that went to considerable lengths to demonstrate why Haunted Canyon is unique and why its attributes make it an outstanding state resource. In the watershed and surrounding area there are numerous other streams that have been severely degraded. Pinal Creek is undergoing a multimillion dollar remediation of metals that contaminate its waters. Miami Wash and Bloody Tanks Wash also have been severely degraded by mining activities and other urban activities. The upstream portion of Pinto Creek is impaired by previous copper mining and has been placed on the § 303(d) list.

On the other hand, Haunted Canyon is a pristine stream with no signs of degradation. Its water quality is exceptional and of great regional significance. ADEQ made no comment on my statement about the uniqueness of Haunted Canyon to serve as a major seed source and a fish and macroinvertebrate source to Pinto Creek. Furthermore, ADEQ made no mention of the awesome overstory of dense riparian vegetation of Haunted Canyon and the outstandingly remarkable aesthetic feature this vegetation provides. Its recreational value is high in the sense that it receives relatively low use, but the quality of the experience is exceptional. I believe that ADEQ should reconsider those characteristics and at least acknowledge that Haunted Canyon does possess exceptional ecological significance.

Response: ADEQ agrees that Lower Haunted Canyon is ecologically significant because of its perennial water, riparian habitat, and the presence of Forest-sensitive, state-listed endangered and threatened species, and federal and state candidate species. However, for the reasons stated in the preamble and in the agency responses to public comments, ADEQ did not classify Lower Haunted Canyon as a unique water on the ground of exceptional ecological or recreational significance.

87. *Comment:* I acknowledge that the ADEQ Director can exert discretionary authority to designate or not to designate a nominated stream. In this triennial review, ADEQ considered a comment from the U.S. Forest Service regarding my nomination. Unfortunately, ADEQ's discussion cites the circular logic that if pumping from the well field should harm the canyon or stream then the copper company will pump more water from the well field to mitigate this harm. While I support the Forest Service's requirement to mitigate any impacts in Haunted Canyon, I do not see how the proposed mitigation plan will work. In fact, it poses a grave threat to the ecological health of the watershed. I ask the ADEQ Director to look closer at the faulty logic behind the Forest Service's proposal and response to my nomination. ADEQ should consider specifically the source of the copper project's water from the well field, where the make-up water will come from, and how the pumping will impact the stream's water quality. I do not expect the project will be precluded by a Tier 3 designation. However, I believe that ADEQ can help ensure the preservation of this remarkable riparian area by making Haunted Canyon a Tier 3 stream as I proposed. I think it is important for ADEQ to literally set the standard under which Haunted Canyon's waters can be used, at least with regards to how water quality will or will not be impacted.

Response: ADEQ considered the comments of the Tonto National Forest in deciding whether to classify Lower Haunted Canyon as a unique water. One of the reasons that the Tonto National Forest did not support unique water designation for Lower Haunted Canyon was a concern that unique water classification of the stream would introduce new conditions that would have to be considered in the environmental review and permitting of the Carlota Mine project (for example, Environmental Impact Statement, NPDES, Aquifer Protection Permit, and § 404 permits). Tonto National Forest was concerned that a unique water classification for Haunted Canyon would further complicate already lengthy environmental review and permitting processes for the project. In particular, the Tonto National For-

est was concerned that a unique water classification for Lower Haunted Canyon may impair the implementation of mitigation measures developed by the Tonto National Forest and agreed to by the Carlota Copper Company to maintain stream flows in Haunted Canyon by diverting pumped groundwater from a water supply well field to Haunted Canyon. The Tonto National Forest was concerned that while water quality data from the well field suggested that the groundwater that would be diverted to Haunted Canyon had a similar water chemistry to the surface water in Haunted Canyon, some differences existed. Tonto National Forest was concerned that if Haunted Canyon was classified as a unique water that the differences in water chemistry would seriously impair the implementation of the well field mitigation program and thus the preservation of existing stream flows in Haunted Canyon.

ADEQ cited these concerns over the continued maintenance of in-stream flow and the possible impairment of the implementation of the well field mitigation measures as reasons for its decision not to classify Haunted Canyon as a unique water in the preamble. ADEQ agrees that these are legitimate concerns and that a unique water classification of Lower Haunted Canyon may impair the implementation of the well field mitigation measures. As has been previously stated, the principal benefit of a unique water classification is Tier 3 antidegradation protection. Tier 3 antidegradation protection means that existing water quality in a unique water must be maintained and protected and water quality cannot be degraded. ADEQ's current Tier 3 antidegradation implementation procedures prohibit direct discharges to a unique water. Also, the antidegradation implementation procedures also prohibit discharges to a tributary to a unique water or discharges upstream of a unique water if a discharge will cause any degradation of existing water quality in a downstream unique water. Consequently, any well field mitigation measures that included a direct discharge to Lower Haunted Canyon would be prohibited by ADEQ's current antidegradation implementation procedures. Also, differences in water chemistry between the groundwater from the well field and existing surface water quality in Lower Haunted Canyon raise the possibility of degradation of water quality in Lower Haunted Canyon. If Lower Haunted Canyon was classified as a unique water, the discharge of pumped groundwater from the well field into a tributary to Lower Haunted Canyon or upstream of the unique water segment would be prohibited if the discharge resulted in the degradation of water quality. If the discharge of pumped groundwater resulted in any degradation, no matter how limited, it would be prohibited by ADEQ's current unique water antidegradation implementation policies. Thus, a unique water classification of Lower Haunted Canyon could prevent the implementation of the well field mitigation measures if existing water quality would be degraded in any way by the discharge of the pumped groundwater into Haunted Canyon. There are no mechanisms for allowing limited degradation of water quality of a unique water.

The Haunted Canyon nomination cites the possible reduction of natural flows in Haunted Canyon from a cone of depression caused by ground water pumping in the proposed well field associated with the Carlota Copper Company project as a threat to Lower Haunted Canyon [See Unique Waters Nomination for Lower Haunted Canyon, p. 6-7]. ADEQ also is concerned about the threat to the maintenance of in-stream flows in Lower Haunted Canyon.

It should be noted that a unique water classification of Lower Haunted Canyon would not prevent groundwater withdrawals from the proposed well field even if it could be proved that a cone of depression associated with the well field reduced in-stream flow in the unique water. ADEQ has no authority to regulate groundwater withdrawals or rights to surface water under the Clean Water Act. Nothing in the Clean Water Act (or the federal or state regulations that implement the Act like the antidegradation rule) can be construed to supersede or abrogate rights to quantities of water which have been established by a state [See § 101(g) of the Clean Water Act]. ADEQ cannot regulate groundwater withdrawals under ADEQ's Tier 3 antidegradation rule, even if groundwater withdrawals lower the water table and result in the de-watering of Lower Haunted Canyon. Similarly, ADEQ would not be able to regulate groundwater withdrawals that reduce in-stream flow that cause degradation of water quality. ADEQ will not be able to regulate groundwater withdrawals until the Arizona Legislature provides explicit statutory authority for ADEQ to regulate groundwater withdrawals for water quality purposes.

For this reason, ADEQ was concerned that a unique water classification may do more harm than good if it interfered with the agreed-to mitigation measures to maintain in-stream flow in Lower Haunted Canyon. ADEQ made a judgment that the preservation of in-stream flow in Haunted Canyon was important and did not want to do anything that might adversely affect the maintenance of flows in Haunted Canyon. A unique water classification would not prevent groundwater withdrawals from the well field and it may have a negative impact on the maintenance of in-stream flow in Lower Haunted Canyon if it prevents implementation of the mitigation measures.

Finally, it should be noted that Haunted Canyon is protected under the Tier 2 antidegradation rule. Tier 2 antidegradation protection requires the maintenance and protection of existing water quality in high quality surface waters, but it provides more regulatory flexibility than the Tier 3 antidegradation rule. The Tier 2 antidegradation rule allows for limited degradation of existing water quality under a set of prescribed conditions. ADEQ believes that the Tier 2 antidegradation rule will ensure that the existing high quality is adequately protected without running the risk of impairment of the mitigation measures to preserve in-stream flows of Lower Haunted Canyon.

88. *Comment:* In proposing Lee Valley Creek as a unique water, you are going against your own rules. It is not a free-flowing creek as Lee Valley Reservoir is across it. I also feel that it should not be considered for two reasons: 1) It is in the Mt. Baldy Wilderness Area and already is adequately protected. Knowing the limited resources you have available, I feel you could better use your time on other, less protected streams, and 2) Lee Valley Reservoir has a population of grayling introduced by the Arizona Game and Fish Department. It also, no doubt, has rainbow trout which are not native. These trout can interbreed with the Apache Trout. Therefore, I do not feel that making Lee Valley Creek a

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unique water will improve the protection of the Apache trout and ask that you reconsider your decision to propose the same.

Response: ADEQ disagrees that it is violating its own rules in classifying Lee Valley Creek as a unique water. First, it must be noted that the proposed rule that a surface water be “in a free flowing condition” is not an eligibility requirement for a unique water classification under the current rules. However, even if it was, ADEQ believes that Lee Valley Creek meets the “free-flowing condition” eligibility requirement for unique waters classification. First, the segment of Lee Valley Creek that is nominated for unique waters classification is perennial and “in a free-flowing condition” above Lee Valley Reservoir. The presence of a reservoir below the nominated segment does not prevent unique waters classification, even under the new eligibility requirement. Second, Lee Valley Creek is of exceptional ecological significance because of the presence of the Apache trout, an endangered species. Finally, the unique water classification of Lee Valley Creek is supported by the Apache-Sitgreaves National Forest, the public land management agency with responsibility for managing the public lands where Lee Valley Creek is located. For all of these reasons, ADEQ decided to classify Lee Valley Creek as a unique water.

89. *Comment:* These comments are addressed to and are wholeheartedly in support of ADEQ’s proposal to retain the unique waters designations for the entire reach of Peeples Canyon Creek, including Sycamore Springs. ADEQ received a request from the Arizona Office of the Bureau of Land Management (BLM) to review the existing classification of Peeples Canyon Creek as a unique water. The existing listing of Peeples Canyon Creek is from its headwaters to its confluence with the Santa Maria River. BLM requested that ADEQ shrink the unique waters designation so that it would cover only a 1/4 mile segment of Peeples Canyon Creek associated with South Peeples Spring. Although BLM failed to disclose its motives, there was no dispute that BLM requested the de-listing of Sycamore Spring so it could be used as a cattle trough. Several years ago BLM had tried to issue a decision authorizing the use of Sycamore Spring as a livestock watering area, but the Interior Board of Land Appeals reversed BLM’s decision because of Sycamore Spring’s unique water designation. Without it, BLM would have already converted Sycamore Spring from a desert oasis to a cattle concentration area - trampled, denuded of vegetation, and filled with urine and manure. BLM’s request was strongly opposed by a coalition of a dozen environmental organizations and individuals in both written comments and personal appearances at public hearings on a preliminary ADEQ rule which set out BLM’s proposal. We asserted that the entire reach of Peeples Canyon Creek, including the headwaters of the creek around Sycamore Spring deserved continued protection as a unique water. The dozen environmental groups and individuals strongly support ADEQ’s proposal to retain the unique water designation for all of Peeples Canyon Creek including Sycamore Spring. We also support the reasons given by ADEQ for this proposed decision set out in the preamble to the proposed rulemaking.

Response: ADEQ decided not to propose any changes to the current listing of Peeples Canyon Creek as a unique water for the following reasons:

1. Peeples Canyon Creek, from its headwaters to its confluence with the Santa Maria River, is currently listed as a unique water in R18-11-112. ADEQ has never “de-classified” a unique water and does not believe that a declassification action is consistent with the intent of the state’s antidegradation rule. Moreover, ADEQ believes that the declassification of a unique water establishes a bad precedent for the unique waters program as a whole that could lead to additional requests to declassify and remove Tier 3 water quality protection from other established unique waters. As a general policy, unique waters should be maintained and protected for future generations. Once a unique water is established by rule, there should be no possibility of “delisting” it and removing its special status.
2. Restricting the unique water classification to the area around South Peeples Spring would remove Tier 3 antidegradation protection from the Sycamore Spring area in the headwaters of Peeples Canyon Creek located in the Arrastra Mountain Wilderness Area. The practical result of this action would be to facilitate the use of the Sycamore Spring area of Peeples Canyon Creek as a livestock watering area. ADEQ believes that this would lead to significant degradation of existing water quality in the Sycamore Spring area. This result can and should be avoided by retaining the unique waters classification on the entire stream.
3. The Sycamore Spring area of Peeples Canyon Creek is perennial, has exceptional wilderness values, and meets the criteria for unique water classification. While the Bureau of Land Management may be technically correct that the current listing of Peeples Canyon Creek is inconsistent with the original nomination documents submitted by BLM in 1985, the entire stream from its headwaters to its confluence with the Santa Maria River has been afforded Tier 3 antidegradation protection since 1992. ADEQ sees no good reasons to change the unique waters classification now and provide Tier 3 water quality protection in Peeples Canyon Creek on a limited and piecemeal basis.

90. *Comment:* The Arizona Mining Association generally supports the proposed changes to the unique waters process to the extent that the changes will allow potential petitioners to understand the process more clearly and thereby result in fewer unique water listing nominations that are more defensible. As noted above, the Arizona Mining Association strongly supports the proposed change to the antidegradation provisions to clarify that waters nominated for unique water status do not qualify for Tier 3 antidegradation protection until the waters are actually listed as unique during a triennial review process.

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Response: The purpose of the proposed changes to the unique waters rule is to clarify eligibility criteria, procedural requirements, and more fully explain the factors that ADEQ will consider when making decisions on proposed unique waters classifications. For reasons stated in the preamble and in responses to previous comments on Tier 3 antidegradation, ADEQ repealed Tier 3 antidegradation protections for proposed unique waters in the final rule.

91. *Comment:* The Arizona Game and Fish Department along with other state, federal and private groups have been working for over 25 years to re-establish the Apache trout and Gila trout to their historic range. The Apache trout is currently on the threshold of being the first fish species de-listed through conservation and recovery efforts. The recovery process is more involved than just putting fish into the water. The habitat must first be manipulated to remove identified threats. These modifications include the construction of fish barriers (hydrological modifications disqualify streams for unique water classification) to prevent rainbow trout from moving upstream and hybridizing with the Apache trout. The barriers also serve to limit ingress of predators and competitors. Once these barriers are in place and functional, the upstream portion of the river is renovated with a piscicide such as rotenone or antimycin to remove the rainbow trout and other non-native fish. These piscicides are very transitory and are always neutralized before they move downstream to areas that are outside of the treatment zone. The fish barriers must be maintained on a regular basis to ensure that the Apache trout remain isolated and protected from re-invasion by downstream fish communities. This maintenance could cause some limited, short-term, transitory water quality degradation. All of the waters that are proposed for unique waters designation need either their barriers rebuilt or renovation with a piscicide. The goals of the Clean Water Act include restoring the chemical, physical, and biological integrity of the waters of the United States. The water quality standards cannot focus too closely on absolute chemical components or we may never fully realize the biological aspect of the Act. Our concern is that rules and regulations may be substituted for thinking and critical judgment. The Arizona Game and Fish Department feels that the recovery of threatened, endangered, and native species is too important to risk a unique water designation if that designation limits or removes any fisheries management options. When a water is designated as a unique water it should be made very clear that the recovery and maintenance of a species or fishery is a priority and that it is acceptable to deviate from the regulations. We must maintain an ability to manage unique waters for those attributes that make it unique in the first place, including its biological integrity.

Response: A unique water classification does not preclude fishery management options designed to assist the recovery of threatened or endangered native fish species. The maintenance and protection of existing water quality in unique waters and the prohibition against degradation provided by Tier 3 of the antidegradation rule does not prohibit temporary, short-term alterations in water quality that may be associated with fishery management activities. This includes temporary or short-term water quality degradation associated with the construction and maintenance of fish barriers and the application of piscicides like rotenone and antimycin. Moreover, the surface water quality standards rules include R18-11-116 that specifically authorizes such fishery management activities by natural resource management agencies. R18-11-116 applies to unique waters.

92. *Comment:* While we do not disagree that the process by which unique waters are nominated and accepted could use revision, we disagree with ADEQ's proposed changes. First, we disagree that a unique water should be a perennial water. Effluent-dependent waters, due to the fact that they flow continuously year-round, are capable of sustaining fish populations and providing unique and exceptional recreational opportunities. As a result, there is no legitimate reason to exclude effluent-dependent waters from consideration as unique waters.

Response: ADEQ disagrees that an effluent-dependent water consisting of treated wastewater discharges is eligible for consideration as a unique water. An EDW is a manmade surface water whose flow is regulated by wastewater treatment plants. EDWs typically do not have exceptional water quality and while they may support ecosystems that provide a net ecological benefit in our desert state, they typically are water quality-limited systems. EDWs do not have exceptional recreational significance. ADEQ discourages both full body contact and partial body contact recreation in EDWs because they are created by discharges of effluent from wastewater treatment plants.

93. *Comment:* The fact that a nominated water is not "free-flowing" does not necessarily impact its ability to be of exceptional recreational or ecological significance. In some cases, an impoundment can actually create a location, such as a reservoir, which could become an exceptional area. Lake Roosevelt, north of Phoenix could be such an area. In addition, many impoundments are temporary structures that could be removed. The free-flowing condition requirement appears to be arbitrary and completely irrelevant to the determination of the value of a waterway to either the environment or recreational uses.

Response: The eligibility requirement that a surface water be "in a free-flowing condition" is not arbitrary. The "free-flowing" requirement is based on eligibility criteria for Wild and Scenic Rivers designations. In general, ADEQ thinks that it is appropriate to limit eligibility for unique waters classification to surface waters that remain essentially natural in character that have not been significantly modified by man. However, the commenter makes a legitimate point that lakes, impoundments, and reservoirs should be eligible for unique waters classification because they may be of exceptional recreational or ecological significance. ADEQ did not consider the eligibility of lakes because virtually all of the lakes in Arizona are artificial impoundments that are created by dams. There are very few natural lakes in Arizona. Moreover, in the 20-year history of the unique waters program, no lake has been nominated or classified as a unique water. The unique waters program has focused on the protection of rivers and streams that constitute outstanding state resource waters. ADEQ agrees that eligibility criteria for lakes should be developed, but ADEQ does not think they can be addressed in this triennial review.

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94. *Comment:* We oppose ADEQ's position that unique waters cannot be impaired waters. Such a position provides incentives to pollute Arizona's waters as a way of keeping them from becoming classified as unique. There is no legitimate reason why impaired waters cannot meet one of the four criteria listed that are required for a unique water classification. We support establishing criteria to guide ADEQ in the unique waters determination, and we believe that the criteria at the top of p. 1861 are all reasonable and legitimate. These criteria should be the standard and not irrelevant characteristics of the water that have no effect on the area's satisfaction of the necessary criteria.

Response: Surface waters with impaired water quality cannot reasonably be considered to be outstanding state resource waters. Surface water quality should meet or be better than applicable surface water quality standards in order for that surface water to be considered for classification as a unique water. Exceptional water quality (or water quality that is consistently better than water quality standards has been one of the primary designation criteria for unique waters since the inception of the unique waters program [See Arizona Water Quality Control Council Unique Waters Policy, p. 2 (April 8, 1981)].

95. *Comment:* We believe ADEQ should examine all available data when making a unique waters determination. In no circumstance would we support confining the examination to only the Arizona Rivers Assessment Project. While that may be a useful tool, it should be only one of several factors considered in the unique waters determination. ADEQ must acknowledge that a location may be of exceptional recreational value because very few people actually go there.

Response: ADEQ agrees that evaluation of unique waters nominations should not be limited to evaluation against Arizona Rivers Assessment Project criteria. ADEQ did not make the submittal of information from the Arizona Rivers Assessment Project evaluation methodology a requirement of the nomination process. While ADEQ agrees that the Arizona Rivers Assessment Project evaluation methodology is a useful tool that can guide ADEQ in its decision-making process, it is only one of several decision factors that ADEQ will consider.

It is difficult to argue that a surface water has "exceptional recreational significance" when very few people actually go and recreate there. An isolated and remote surface water where few people go may have exceptional wilderness characteristics or scenic values. It may have exceptional ecological significance. However, it is difficult to argue that a surface water is of exceptional recreational significance when public access is very limited or difficult, the surface water provides limited opportunities for recreation, and the surface water is not used for recreation or its recreational use is very limited.

96. *Comment:* The proposed rule does not clearly state when the unique waters determination would occur. ADEQ indicates that the evaluation process will occur outside of the triennial review. However, two paragraphs later, ADEQ states that unique waters classifications will only be considered only as part of the triennial review. We believe it is necessary for ADEQ to consider unique waters nominations at least on a yearly basis. This would allow maximum protection for both water quality and economic interests.

Response: ADEQ disagrees that it should consider nominations for unique waters classification annually. Unique waters classifications must be done by rule and the rule that governs the unique water program is included within the surface water quality standards rules. ADEQ is required by the Clean Water Act to conduct the triennial review of surface water quality standards. It is logical and efficient to formally consider unique water nominations in the triennial review process. Annual reviews of unique waters nominations would place an unreasonable administrative burden on ADEQ. Under the State Administrative Procedures Act, the rulemaking process typically takes from 9 months to a year to complete. ADEQ would be constantly engaged in rulemaking if it considered unique waters nominations on an annual basis. No change to the rules.

97. *Comment:* We support ADEQ's designation of 10 additional waters as unique waters. We further support ADEQ's position that delisting a unique water is inconsistent with the state's antidegradation rule.

Response: ADEQ appreciates the statement of support for additional surface waters that are proposed for unique waters classification in the final rules. The final rule includes 9 new unique waters. The addition of the 9 new unique waters almost doubles the current number of unique waters in the state.

98. *Comment:* Thank you for conducting the ADEQ hearing with respect to unique waters and the triennial review of surface water quality standards in Globe, Arizona on June 26, 2001. Please allow this letter to signify my 100% consent and support for ADEQ's findings with respect to not classifying Pinto Creek and Lower Haunted Canyon as unique waters. I wholeheartedly agree that Pinto Creek should not be designated as a unique water based on the comprehensive criteria and the decision-making process established by the Arizona Department of Environmental Quality in conjunction with its responsibility to implement the Clean Water Act in Arizona. Review of all of the facts pertaining to Pinto Creek and comparing the established and known facts with those included in the criteria for evaluation and classification of surface waters in the Globe-Miami and surrounding communities, it is undoubtedly clear that Pinto Creek does not qualify and should not be classified as a unique water. I sincerely appreciate your consideration of this letter as one more letter in unanimous and clear support in favor of ADEQ's recommendation to not include Pinto Creek among the 10 surface waters being designated as unique waters in this year's triennial review process.

Response: ADEQ appreciates the public participation in the decision-making process to consider the Pinto Creek and Lower Haunted Canyon Creek unique waters nominations. ADEQ believes its final decision is adequately supported by the administrative record in this rulemaking.

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99. *Comment:* On behalf of the 3000 members of the Maricopa Audubon Society in central Arizona we would like to comment on your rulemaking proposals on unique water designations. We find ADEQ's proposed 7 pages of new, complex, detailed, and technical criteria for the submission of unique waters nominations to be blatantly unfair, shutting out citizens from making unique waters nominations. Explanations given for the requirements are impossibly long, running 7 pages, with incomprehensible wording and concepts (e.g., "low flow refugia areas," "obligate and facultative riparian wildlife," and a complexity of depth worthy of a Ph.D. thesis. Instead, you should ask citizens for a nomination that contains reasonable, documented information, which enables ADEQ to make serious, preliminary eligibility determinations. Leave requirements for a complete and final submission until after the initial nomination, when development of a final administrative record properly should occur. Make unique waters a collaborative, not an antagonistic process.

Response: ADEQ's lengthy discussion of the unique waters nomination process and information requirements in the preamble was an attempt to clarify ADEQ's thinking on the unique waters nomination and decision-making processes. Very little of this discussion in the preamble to the Notice of Proposed Rulemaking was actually incorporated into rule. The discussion in the preamble was ADEQ's attempt to fully explain the agency's thinking on how to evaluate unique water nominations and to provide guidance to persons making unique waters nominations. However, ADEQ agrees that the information requirements presented in the preamble were too long and overly complex. For this reason, ADEQ decided to retain the basic nomination requirements prescribed in the current rule. ADEQ does not want to "shut out" citizens from making unique waters nominations. ADEQ is interested in developing a unique waters classification process that is fair, less adversarial, that permits full public participation in the decision-making process, and that results in principled decisions on unique water nominations. ADEQ welcomes suggestions and recommendations on appropriate revisions to the unique waters process that will achieve that result.

100. *Comment:* What impact will unique waters classification of lower Haunted Canyon and lower Pinto Creek have on the proposed Carlotta Mine? Is not the purpose of unique waters to preserve the current water quality of unique waters segments? One would think such purpose would be common to ADEQ, other concerned agencies, companies, and citizens alike. Removing needless concerns would go far to assist the process.

Response: ADEQ will not speculate on the impact that unique waters classifications may have on the proposed Carlotta Mine project. All that can be said is that if Lower Haunted Canyon and Lower Pinto Creek were classified as unique waters, the existing water quality of those surface waters would have to be protected from degradation. Certainly, NPDES permit conditions for the Carlotta Mine project would have to be evaluated to ensure that existing water quality in downstream unique waters was maintained and protected.

ADEQ agrees that the primary purpose of a unique waters classification is to prevent degradation of existing water quality in a unique water. The purpose of the unique waters program is to recognize surface waters in Arizona that are of exceptional recreational or ecological significance that, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or similar values. The primary purpose of the unique waters program is to maintain and protect existing water quality so unique waters and their immediate environments will be protected for the benefit and enjoyment of present and future generations.

101. *Comment:* How can ADEQ not find lower Pinto Creek of exceptional ecological significance? Why isn't eligibility for Wild and Scenic Rivers designation alone sufficient justification? (Maricopa Audubon Society).

Response: ADEQ's reasons for not classifying lower Pinto Creek as a unique water are fully explained in the preamble to this rule. Eligibility for Wild and Scenic Rivers designation by itself is not sufficient justification for a unique waters classification. Eligibility for a Wild and Scenic Rivers designation is just one factor that ADEQ considered in the decision-making process. ADEQ considered other factors before making its decision not to classify Pinto Creek as a unique water, including the listing of Pinto Creek as an impaired surface water on the § 303(d) list, the public comments in support or opposition to the nomination, the weak association of Pinto Creek with federally-listed, endangered or threatened species, and the opposition of the Tonto National Forest to the nomination.

102. *Comment:* How can lower Pinto Creek be found ineligible "primarily because the stream is water quality limited for dissolved copper and listed on Arizona's § 303(d) list" when ADEQ and EPA acknowledge there is no copper over-exceedance, that there has not been any since at least 1994, that no remedial action is therefore necessary? How can ADEQ say that Pinto is ineligible because of a listing that is improper and evidently has been improper since at least 1994, if not originally, and is to be removed in the spring of 2002? Why is ADEQ's failure to de-list lower Pinto from the § 303(d) list for 8 years a reasonable basis to find lower Pinto ineligible? Why can't Pinto be found eligible now on the basis of an improper de-listing? Will ADEQ require a new lower Pinto nomination in the next triennial review on the basis of the proposed new extensive criteria because of a technicality of ADEQ responsibility and one with no foundation in fact?

Response: ADEQ thinks it is reasonable to limit eligibility for unique waters classification to surface waters that are not identified as impaired waters and are not listed on the § 303(d) list. While there may be debate over whether the listing of lower Pinto Creek is proper or whether lower Pinto Creek should be "de-listed" from the § 303(d) list, the fact remains that the entire Pinto Creek, from its headwaters to Roosevelt Lake, is identified as an impaired surface water and it remains on the § 303(d) list. A TMDL for Pinto Creek was under development at the time the nomination for unique water classification was under consideration. As long as lower Pinto Creek remains on § 303(d) list,

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ADEQ believes it should remain ineligible for unique waters classification. Nothing precludes anyone from re-submitting a unique water nomination of Pinto Creek if a TMDL is completed or Pinto Creek is de-listed.

103. *Comment:* How can ADEQ not find lower Haunted Canyon of exceptional ecological significance? To find perennial water in an arid high desert stream reach is rare. Where else at 3500 feet altitude in the Arizona arid high desert is canopy cover at 95%? Where is there a stream reach the likes of Haunted Canyon with 16.1 acres of riparian habitat with a tree density of 145 stems / acre?

Response: The reasons for ADEQ's decision not to propose lower Haunted Canyon Creek as a unique water are fully explained in the preamble. ADEQ agrees with the nominators that the riparian corridor in lower Haunted Canyon is ecologically significant. However, for the reasons stated in the preamble and in other responses to comments, ADEQ did not exercise its discretion to classify lower Haunted Canyon as a unique water.

104. *Comment:* Why does ADEQ limit "exceptional recreational significance" only to areas with high numbers of users? Can a stream with 10,000 monthly visitors even qualify for unique waters under recreational significance? Why can't quality of recreational experience, not visitor-days rule? Why does ADEQ shut out preserving stream reaches of unique attributes from the many persons in the state seeking unpaved outdoor, exceptional recreational experiences. Why shut out from consideration unique but relatively more isolated areas from birders, fishermen, hikers, graduate school researchers, photographers, campers, mountain bikers, etc.?

Response: ADEQ does not limit "exceptional recreational significance" only to those surface waters with a high number of users nor does ADEQ "shut out" stream reaches from unique waters consideration because they are relatively isolated. In fact, the final rules include unique waters that are in relatively isolated watersheds and that are not heavily used for recreation. However, ADEQ still thinks that the level of recreational use is a relevant factor that ADEQ will consider when making a decision on a unique waters nomination based on grounds of "exceptional recreational significance." ADEQ does not disagree with the commenter that the quality of a recreational experience provided by a surface water is an important consideration. Nonetheless, ADEQ thinks it is reasonable to consider the level of recreational use and how isolated a surface water is, how difficult it is to get to, how many people may use the surface water for recreation, as well as the quality of the recreational experience provided when the agency makes a determination as to whether a surface water constitutes an outstanding state resource water because it is exceptional recreational significance.

105. *Comment:* Asarco has no comments on the specific comments being proposed for classification as unique waters. Although we have some concerns with the expanded criteria for unique waters classification, we support the proposed changes to the unique waters process in proposed R18-11-112(F) -(G). Having a meeting in the location of the proposed designation will allow ADEQ to receive valuable public input from those most likely to be affected by the proposed designation, and identifying factors (presumably not exclusive) that ADEQ will consider in making its decision provides helpful guidance to those who are considering making a nomination.

Response: It has been standard practice for ADEQ to hold a public meeting in the local area of a surface water that is nominated for unique waters classification in order to solicit public comment from persons in local communities who will be most directly affected by a proposed classification. The final rule includes this public meeting requirement.

106. *Comment:* We are supportive of holding public hearing but do not believe you should limit it to just the local area. The definition of a unique water says a "unique water means a surface water that has been classified as an outstanding state resource water by the Director." By definition, unique waters are important state resources and are important to all Arizonans, not just those who are lucky enough to live in areas near them. Therefore, the public hearings should not be limited to only those areas.

Response: The final rule states that the Department shall hold at least one public meeting in the local area of a nominated unique water to solicit public comment on the nomination. However, this requirement does not limit public hearings only to the local areas where unique waters are nominated. R18-11-112(A) of the final rule makes clear that surface waters are classified as unique waters by rule. This means that the public participation procedures that apply generally to rulemaking apply to the unique waters classification process. The Department always holds public meetings to consider revisions to the surface water quality standards rules, including proposed unique waters classifications. These public meetings are usually held in the major metropolitan areas of the state. In this triennial review, public meetings to consider proposed unique waters were held in Phoenix, Tucson, and Flagstaff as well as in locally-affected communities. ADEQ agrees that proposed unique waters classifications are of statewide importance and that the public-at-large should have an opportunity to comment on proposed nominations and participate in the decision-making process. ADEQ believes that the public had several opportunities to participate in both the informal and formal rulemaking processes.

107. *Comment:* We have some questions and concerns with the additional criteria identified in proposed

R18-11-112 (D). We are concerned that the additional criteria are too expansive and dilute the intent of a unique waters program. The simple fact that a water is perennial ought not to be enough, standing alone, to make it unique. Every perennial stream in the state is now potentially open to unique water classification, regardless of its other characteristics. This is far too broad. Something more than the presence of water should be required before unique water status is conferred.

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Response: A surface water quality is not eligible for unique waters classification simply because it is a perennial surface water. The requirement that a surface water be perennial is one of four eligibility requirements. Under the final rule, a surface water must be perennial to be eligible for unique waters classification. However, the surface water also must be in a free-flowing condition, have good water quality, and it must either be of exceptional recreational or ecological significance or there must be a known association of the surface water with a federally-listed endangered or threatened species. All of these eligibility requirements must be satisfied before a surface water will be considered for unique waters classification.

108. *Comment:* We are concerned that the free-flowing water criterion is equally overbroad. Under this criterion, any water that has not been modified, including virtually all ephemeral waters, could qualify as unique. Again, it is unclear why this factor alone should be enough to qualify a water as unique.

Response: The requirement that a surface water be in a free-flowing condition is one of several eligibility requirements. Also, an ephemeral water would not be eligible for unique waters classification because it is not a perennial water. See response to the previous comment.

109. *Comment:* Merely having water quality that meets all applicable standards should not, standing alone, be the basis for qualifying a water as unique. Basically, this could result in all waters in the state being either impaired or unique, which does not seem to make sense. For example, if the next § 305(b) report concludes that 40% of waters are not fully meeting designated uses, then 60% of waters could classify as unique under this proposal. Again, something more ought to be present before the water is qualified as “unique.”

Response: The comment shows a misunderstanding of the eligibility requirements in the final rule. The final rule states four general eligibility requirements for unique waters classification: 1) The surface water must be a perennial water, 2) be in a free-flowing condition, 3) have good water quality (that is, meets applicable water quality standards), and 4) be of exceptional recreational or ecological significance or a threatened or endangered species is known to be associated with the surface water. All four requirements must be satisfied for a surface water to be eligible for unique waters classification. It is not enough to meet one of the requirements.

110. *Comment:* We support the proposal that impaired waters should not be able to qualify as unique waters. We do not support the converse of this statement (that all non-impaired waters can qualify as unique).

Response: ADEQ agrees that impaired waters identified on the § 303(d) are not eligible for unique waters classification. All non-impaired waters do not qualify as unique waters for the reasons stated in the response to the previous comment.

111. *Comment:* If these three new factors (eligibility requirements) are adopted as proposed, ADEQ can expect to be deluged with unique waters nominations in future triennial reviews (at least if the current triennial review is any guide). Although ADEQ retains discretion to classify waters as unique, it will need to expend significant resources responding to these petitions. We are also concerned that the overbroad nature of the criteria will make it easier for those who seek to classify waters as unique not because of the attributes of the water, but rather in order to achieve another goal (for example, to stop an activity that they oppose). We believe that the three new criteria in proposed R18-11-112(D)(1)-(3) belong, if anywhere, in proposed R18-11-112(G), as factors ADEQ can consider in determining whether to classify a water as unique (that is, whether it is perennial and free-flowing are factors that tie into ADEQ's exercise of discretion as to whether to accept a unique waters nomination). This seems a more logical approach than saying, for example, that any unmodified (that is, free-flowing) water qualifies as unique.

Response: ADEQ disagrees that the new eligibility requirements will result in an increase in the number of nominations of surface waters for unique water classification. On the contrary, the new requirements more specifically describe the universe of eligible surface waters. If the new eligibility requirements become effective, only perennial surface waters that are in a free-flowing condition, that meet applicable water quality standards, and that are of exceptional recreational or ecological significance will be eligible for unique waters classification. These new requirements provide more guidance to persons who may want to nominate surface waters and should prevent the nomination of surface waters that ADEQ considers ineligible for unique waters classification. For example, the new requirements should prevent the nomination of ephemeral and intermittent surface waters. Also, the new eligibility requirements should prevent the nomination of impaired surface waters that are listed on the § 303(d) list. Clear and concise eligibility requirements, in rule, will reduce the number of nominations that ADEQ considers ineligible for unique waters classification and that would have no chance of success. ADEQ disagrees that the eligibility requirements should be included as decision-making factors in R18-11-112(G). The eligibility requirements are minimum criteria that must be met before ADEQ will consider the proposal of a surface water for unique water classification.

112. *Comment:* We are not clear why ADEQ references two lists of threatened or endangered species in proposed R18-11-112(D)(4)(b)(i) and (ii). Isn't the second list simply a subset of the first list? Will there ever be situations where the lists differ because they are published at different times, and one may not reflect changes that are contained in the other? It would seem more sensible to simply reference a single list.

Response: ADEQ agrees that the second list is unnecessary. Both lists contain threatened and endangered species listed by the U.S. Fish & Wildlife Service. All of the species that are in “Federally-Listed Threatened and Endangered Species of Arizona” are listed in 50 CFR § 17.11 and § 17.12. ADEQ revised the final rule by striking the unneces-

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sary incorporation by reference of “Federally-Listed Threatened or Endangered Species of Arizona” in the proposed R18-11-112(D)(4)(b)(ii).

113. *Comment:* ADEQ is concerned that the extension of Tier 3 antidegradation to proposed unique waters encourages the nomination of surface waters believed threatened by mining, grazing, timber harvesting, growth and development, or other land uses but cannot reasonably be considered outstanding state resource waters. Please delete this justification on the following grounds: 1) ADEQ’s singling-out presumed motivations of a particular interest group and its unsubstantiated linkage of the deletion to discouraging unreasonable nominations are not clear, 2) How could Tier 3 antidegradation rules be applied instantly on the basis of a proposed *unreasonable* nomination? The Director, not the nominator, proposes a classification....what Director would propose an unreasonable nomination? 3) In general, it is the right of nominators, of whatever interest, to submit nominations, whether reasonable or not in the view of ADEQ or whether in keeping or not with rulemaking. Hence, it is not clear that the above change would have the intended impact of discouraging future nominations. It is unclear if any change (even the proposed rule’s entire 7 pages of criteria changes) would discourage unreasonable nominations, 4) In general, it is neither productive nor appropriate for the agency to speculate in a public document on the presumed motivations of nominators, whatever their interests, 5) In particular, it is not becoming for a state agency, charged with being neutral, to single out for criticism, in this instance, environmentalists, for submitting nominations intended to comply with regulations as ADEQ wrote them. It would be equally unbecoming for ADEQ to speculate on or criticize the presumed motivations of, for example, mining interests, a speculation / criticism which ADEQ has not done in the proposed rule in response to mining requests. For the record, my motivation to preserve the unique attributes of Pinto Creek did not include instant Tier 3 antidegradation implementation because (a) I was not aware of the provision, (b) had I been aware, I would have not as now seen any circumstance whatsoever in which a Director would propose an unreasonable, incomplete nomination for classification and thereby immediately implement Tier 3 antidegradation rules. In my view, the deletion is justified on the sole basis that the benefit should not be afforded until the classification is legally approved. ADEQ’s fourth justification comes close: “this benefit should not be afforded...prior to the development of a complete administrative record.”

Response: ADEQ agrees that the one of the strongest arguments for not extending Tier 3 antidegradation protection is that Tier 3 antidegradation protection should be afforded to unique waters that have been classified as such by rule after the development of a complete administrative record. However, ADEQ argues that there are other legitimate reasons for not extending Tier 3 antidegradation protection to proposed unique waters, including: 1) inconsistency with federal antidegradation policy, 2) practical implementation problems associated with extending Tier 3 antidegradation protection to proposed unique waters in the absence of data on existing water quality, 3) the relatively short period of time that Tier 3 antidegradation protection would be extended to surface waters that are formally proposed for unique waters classification, and 4) the possibility that the extension of Tier 3 antidegradation protection to proposed unique waters creates a regulatory incentive to nominate surface waters that are believed to be threatened by mining, grazing, timber harvesting, or other land uses. ADEQ statement of concern regarding the number of nominations received in this triennial review is not a criticism of environmentalists for submitting nominations or their motivations for doing so. ADEQ does not question the right of any person to submit nominations of surface waters for unique water classification. The final rule confirms this by clearly stating that any person may submit a nomination of a surface water for unique waters classification.

114. *Comment:* ADEQ’s concern with the number of unique waters nominations this triennial is understandable, but misplaced. Again, the public is entitled to submit the number of nominations it will, 37 this triennial cycle, 370 the next. Even under the current “broad grounds for unique waters classification” of this triennial, ADEQ was able to dismiss 22 nominations of Forest Guardians in four pages without apparent lengthy discussion or other egregious difficulty. To focus on eliminating the “relative ease of nominating surface waters” is inappropriate and suggestive of an ADEQ intent to intentionally complicate the nomination process in order to reduce the number of nominations in the next triennial. Nominations should be relatively easy for the public to make. Rulemaking should focus on clear, simple, and precise nominations that would encourage sufficient documented information in initial nominations to enable ADEQ to make a serious preliminary determination of the eligibility of the nominated reach for unique waters and for the initial nomination to make a significant contribution toward the post-nomination development of a complete administrative record. Can’t ADEQ administratively resolve its concern with the numbers of nominations received or with the numbers of unreasonable, incomplete nominations received? If 370 unreasonable and incomplete nominations are submitted the next triennial review cycle, respond instantly and simply. Return each nomination unmarked with a one-page form letter in which each appropriate item is checked (e.g., “no map,” “most of required sections are absent...”)

Response: ADEQ agrees. As noted in a response to a previous comment, the final unique waters rule states that any person may nominate a surface water for classification as a unique water. ADEQ did not restrict the public’s right to submit nominations. Also, the requirements for nominations have not substantially changed in the rule. While ADEQ considered imposing new information requirements for nominations in the proposed rule, ADEQ considered the public comments addressing the issue and did not adopt the additional information requirements in the final rule. A nominator still must submit a map and a description of the surface water, a written statement in support of the nomination including supporting evidence demonstrating that the applicable criteria for unique waters classification are met, and available water quality data relevant to establishing baseline water quality. While ADEQ has legitimate concerns regarding the increasing numbers of unique waters nominations and the administrative burden of implementing the

unique waters program with limited resources, ADEQ did not complicate the nomination process and has no intention of “shutting out” persons from participating in the nomination process. In this triennial review, ADEQ adopted some new eligibility criteria to more clearly define the universe of surface waters that are eligible for unique waters classification. Hopefully, these new criteria will assist nominators in preparing nominations that meet the minimum requirements of the rule.

115. *Comment:* ADEQ notes the need for numeric water quality standards for Tier 3, that federal antidegradation policy requires that each state identify methods for implementing its antidegradation policy, but that ADEQ at this time does not propose to incorporate antidegradation implementation guidance into the proposed rule. Why isn’t antidegradation guidance incorporated? Will it be? Should there not be a reference to where Tier 3 explanatory text and rule-making is available for public review and comment?

Response: ADEQ does not intend to develop numeric criteria to implement Tier 3 of the antidegradation rule. As the commenter correctly points out, ADEQ is required to identify methods for implementing its antidegradation policy [See 40 CFR § 131.12(a)]. ADEQ has developed draft *Implementation Guidelines for the State of Arizona Antidegradation Standard*. These guidelines are currently under review and ADEQ has stated its intention to revise them in 2002. One of the major issues with respect to the antidegradation implementation procedures guidance document is what aspects of the implementation procedures may remain in guidance and which parts of the guidance should be incorporated into rule. While ADEQ held a few stakeholder meetings to discuss antidegradation implementation during this triennial review, ADEQ was not able to complete revisions to its current antidegradation implementation guidance document. ADEQ intends to initiate a stakeholder process in 2002 to consider revisions to the current antidegradation implementation guidance. This process will be open to the public. Any antidegradation implementation procedures that are developed will be available for public review and comment.

116. *Comment:* Current Tier 3 regulatory guidance is not clear. Please provide additional guidance in lieu of a full set of regulatory guidelines. Are current discharges (for example, from current or historical mining, grazing, and farming) allowed to a stream reach now classified unique waters or to a proposed reach once the classification goes into effect? Are currently approved future discharges allowed (for example, the Carlota Mitigation Plan discharge, a NPDES point source, when and if a NPDES permit goes into effect)? Are such discharges allowed that do not violate surface water standards?

Response: Current Tier 3 antidegradation implementation procedures prohibit new or expanded direct discharges of pollutants to a segment that has been designated as a unique water. This prohibition against direct discharges applies to new sources and the expansion of existing sources. Current guidance also prohibits any discharge activity that results in a permanent new or expanded indirect source of pollutants (that is, to an upstream source or tributary) to a unique water except where the indirect source would have no effect on the existing quality of a downstream unique water segment. Upstream discharges or discharges to a tributary are allowed provided they do not affect existing water quality in a downstream unique water. Future direct discharges to a unique water are prohibited by current guidance. Discharges to tributaries or upstream discharges that are approved (for example, a NPDES-permitted discharge from the Carlota Mine) would be allowed provided it was demonstrated that the existing water quality in the downstream unique water is maintained and protected.

117. *Comment:* Does ADEQ appreciate that critical to the unique waters nominations of lower Haunted Canyon and lower Pinto Creek is what the Tier 3 antidegradation impact would be on the proposed Carlota Copper Mine? ADEQ does not address the specifics of Tier 3 applicability in its ineligibility finding of these two nominations. If the current agency / company permits and agreements are considered sufficient by ADEQ in terms of providing Tier 3 protection, then such an ADEQ position possibly would have taken this issue out of the discussion, for example, with the Tonto National Forest (e.g., Tonto N.F. August 25, 2000 letter to ADEQ: “We believe that the company is being held to a high standard of environmental protection and that the introduction of new conditions (unique waters status) into the environmental permitting mix may complicate any already lengthy process) If Tier 3 would shut down the proposed Carlota Copper Project or prohibited grazing, then this too would have focused the discussion. However, ADEQ has said in public hearings that such shutdowns would not be the case. This lack of awareness of the Tier 3 impact has legitimately concerned members of the public. I am aware of at least one other agency concerned with the unknown aspects of Tier 3 applicability. It is difficult to address what we don’t know. Possibly, overly defensive postures if not blanket opposition to nominations emerge and focus is shifted, possibly needlessly, from what one would think would be in the interest of all parties: protecting clean water in streams with very special attributes from further degradation.

Response: ADEQ appreciates the fact that the unique waters nominations of Pinto Creek and Lower Haunted Canyon and the application of Tier 3 antidegradation implementation procedures may have an impact on the proposed Carlotta Mine. A unique water classification will affect any proposed discharge activity in a watershed where a unique water is located if it is demonstrated that the discharge may affect existing water quality in the unique water. While direct discharges to unique waters are prohibited by Tier 3 antidegradation policy, upstream discharges and discharges to tributaries are not prohibited. ADEQ did not specifically review the draft NPDES permits for the Carlotta Mine when it made its decision not to propose Lower Pinto Creek and Haunted Canyon for unique waters classification. ADEQ agrees that better guidance on Tier 3 antidegradation implementation and its impact will assist public participation in the unique waters classification process. ADEQ will address the development of specific antidegradation implementation procedures through a separate stakeholder process in 2002.

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118. *Comment:* ADEQ should add the degree of current protection to the nomination criteria in

R18-11-112(G)(9). For example, if a nominated water body is in a federally-protected wilderness area, it would already have relatively greater protection than a water body not in a wilderness area, and, insofar as only this point is concerned, would have a lesser priority in being designated a unique water. In this regard, ADEQ found unique waters classifications largely unnecessary for five streams because locations within established wilderness areas provide an adequate level of protection, and for four others, which may qualify, because of their remote location almost entirely within the boundaries of the Muleshoe Preserve and the already well-managed protection of existing water quality.

Response: ADEQ agrees that the location of a surface water within a wilderness area, national or state park, national recreation area, national conservation area, riparian conservation area, area of critical environmental concern, or some other special use designation (e.g., Wild & Scenic River designation) is a relevant factor when making a decision regarding unique waters designation. ADEQ identified this factor in R18-11-112(G)(9).

119. *Comment:* ADEQ believes that petitions for rule adoption unnecessarily accelerate the decision-making process and short circuits the careful study of surface waters nominated. A unique waters rule should not impose unreasonably short time-frames that result in ADEQ decisions on the eligibility on the basis of limited information. The nomination should start a careful review process that can be accomplished by ADEQ within agency resource and budget constraints and the larger time-frame that applies to the triennial review of surface water quality standards. ADEQ states that the submittal of a nomination will not trigger the initiation of the rulemaking process in the triennial review, but an evaluation outside of the triennial review in order to screen nominations for completeness and solicit informal public comment.....Unique waters classifications will only be considered during a triennial review. Despite a need for clarifying “outside” but “during” the triennial review, I agree conceptually. However, ADEQ’s proposed solution in the proposed rule shifts the burden of careful study of surface waters nominated to the citizen’s initial nomination to an astounding degree. It does so without providing remedy to a citizen submitting lengthy and substantial research, only to have it totally negated by a finding of ineligibility, possibly a finding unrelated to the contents of the nomination (for example, another agency objection). And, whereas ADEQ positively separates rulemaking from the classification process, it could go even further (for example, the proposed rule does not address nominations forwarded under prior triennial rulemaking being unfairly subjected to the current triennial’s on-going rulemaking).

Response: ADEQ repealed the reference in R18-11-112(C) which states that nominations of surface waters for unique waters classification are submitted as petitions for rule adoption. ADEQ repealed this reference because ADEQ rules on public participation in rulemaking require ADEQ to make a decision on whether to grant or deny petitions for rule adoption within 60 days of receipt of a complete petition [See R18-1-302(D)]. ADEQ’s concern that petitions for rule adoption “unnecessarily accelerate” and “short-circuit” the unique waters decision-making process is based primarily on the rule requirement in R18-1-302(D) to make agency decisions on petitions for rule adoption within 60 days of receipt. ADEQ wants to create a more flexible administrative process that allows enough time for the development of complete nominations, informal public participation on candidate unique waters, and careful evaluation of nominated surface waters outside of the formal rulemaking process. ADEQ wants to establish a “two track” process. The first track is an informal nomination and review process that takes place outside of the formal rulemaking process of the triennial review. Nominations of surface waters may be made at any time, information about candidate surface waters could be developed informally, and the initial review of surface waters can be accomplished outside of the formal rulemaking process. The second track is the formal rulemaking process to actually propose and classify a surface water as a unique water that would be accomplished as part of the triennial review of the surface water quality standards rules.

ADEQ agrees that the nomination process described in the preamble to the Notice of Proposed Rulemaking shifted the burden of conducting research and developing information on candidate surface waters to nominators. For this reason, ADEQ did not adopt those information requirements described in the preamble into the final rule. However, ADEQ did incorporate several eligibility requirements for unique waters into rule to provide better guidance to persons who may want to nominate surface waters of ADEQ’s minimum eligibility criteria. The articulation of minimum eligibility criteria in R18-11-112 should prevent nomination of surface waters that ADEQ will clearly find ineligible for unique waters classification and prevent nominators from conducting extensive research on surface waters that have no chance for classification.

120. *Comment:* ADEQ stated in the preamble that it sometimes receives nominations that do not provide enough information to make a decision. This may continue to happen, no matter what rulemaking exists. The solution is not to (a) tax citizens with inappropriate, expensive, time-consuming, and complex research and other nomination requirements for which they likely have no training to undertake, (b) with a process that can negate extensive nomination research on the basis of an ineligibility finding existing from the outset but not apparent to the nominator, and (c) otherwise with a set of nomination criteria that effectively shuts them out of the nomination process. The solution to incomplete nominations is to provide the citizen with (a) education (e.g., clear and reasonable criteria for initial nomination), and (b) with an ADEQ form letter which is quickly checked off and returned to the nominators with their nominations.

Response: ADEQ agrees that education and more comprehensive guidance on the preparation of unique waters nominations will assist nominators in submitting complete nominations. ADEQ did not establish unreasonably complex, expensive, or time-consuming information requirements for the unique waters nomination process. ADEQ has tried

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to make clear in this Notice of Final Rulemaking that the types of information that are described in detail in the preamble to the Notice of Proposed Rulemaking (e.g., Arizona Rivers Assessment Project methods) are not adopted as nomination requirements. The information in the preamble is provided to educate persons who may want to nominate a surface water for unique waters classification about ADEQ's current thinking on the unique waters process and the agency's interpretation of its own rules. ADEQ believes that it has struck a proper balance by promulgating additional eligibility criteria for unique waters that are reasonably clear and concise. These new criteria (that is, a surface water must be a perennial water, in a "free-flowing condition," have good water quality that is better than applicable water quality standards, not be an impaired water that is listed on the § 303(d) list, and either be of exceptional recreational significance or exceptional ecological significance) should assist persons in preparing nominations by better describing the universe of eligible surface waters.

121. *Comment:* The following is a suggested schedule in the triennial that maximizes prospects of careful study of surface water nominations and minimizes administrative burdens, not only to ADEQ but also to nominators, stakeholders, etc. It would, in my view, steer the unique waters designation process toward a more collaborative and less antagonistic process: 1) Have the consideration of nominated unique waters occur in the triennial, but totally separate the consideration process from the rulemaking, except for the final listing of any new reaches proposed for unique waters and explanation for those listings. Establish that nominations in the current triennial are governed by rules set in the last triennial review and that ongoing rulemaking on unique waters aspects are not applicable, 2) Have reasonable and clear criteria, concisely listed and explained, for an initial nomination submission, criteria that (a) provides ADEQ as well as the public with sufficient data to make preliminary eligibility findings but (b) does not initially require exhaustive and complete amounts of data more properly reserved to a post-nomination data completion period. To facilitate nomination data, develop nomination guidelines which include sources for nomination information. Enlist stakeholder volunteers and other agencies to assist ADEQ in developing information sources. This would modify R18-11-112(G) to possibly read: "completeness of the final submitted administrative record of a nominated unique water," 3) Provide a reasonable time period (30 days) for the nominator to supply additional data required in the criteria. Include this information in a form letter for incomplete nominations, 4) If the nomination meets initial data requirements, call an ADEQ-sponsored meeting of stakeholders to discuss the initial nomination, to provide an opportunity for questions, concerns, objections to be voiced from agencies, landowners, companies, and other interested parties, and to allow ADEQ to indicate possible or probable ineligibilities as well as point to future steps to address rulemaking requirements and to produce a complete administrative record. Enlist the nominator and the stakeholders in the process. Call a second meeting if necessary to address issues raised at the first, and possibly to consider additional information submitted by the nominator. If whatever objections cannot be resolved, then offer the nominee the choice to end the process. 5) If no insurmountable ineligibilities are identified, then, at this point, the nominee in collaboration with other stakeholders, ADEQ, and other agencies, can proceed in a cooperative effort to complete technical and other data submissions acceptable to ADEQ. For example, certain technical water quality data may fall to ADEQ to complete. Compiling a list of sensitive species may fall to the nominator, although agencies, stakeholders, and others may contribute. If these submissions meet ADEQ criteria, the Director may propose the classification for listing in the rulemaking to be forwarded to the Governor's Regulatory Review Council.

Response: ADEQ welcomes suggestions on how to improve the unique waters nomination and classification processes that will result in principled decisions on unique waters classifications while making the whole process less adversarial. ADEQ agrees that the initial nomination and review process should take place outside of the formal rule-making processes of the triennial review. For this reason, ADEQ revised the nomination process to clarify that nominations are not submitted as petitions for rule adoption. ADEQ also supports the development of more specific nomination guidelines to assist nominators in developing unique waters nominations. It is clear from this triennial review that there is no consensus on the level of detail or the specific information requirements that need to be in a nomination and its supporting documentation before an initial review can be completed. ADEQ does not support establishing specific deadlines for administrative completeness until these information requirements can be specifically described. In general, ADEQ agrees with an informal stakeholder process that allows all interested parties to discuss nominations, ask questions, and to identify additional information requirements. For this reason, ADEQ included in the final rule a requirement to hold at least one public meeting in the local area of a nominated water to solicit public comment on the nomination. Given ADEQ's experience in this triennial review (37 nominations), ADEQ has legitimate and real concerns about the demand on the ADEQ resources to implement the unique water program. Currently, ADEQ has one staff person who works part-time on implementing the unique waters program. Agency resource constraints must be recognized and the ability to meet other surface water quality standards and ambient monitoring program demands must be preserved, whatever unique waters classification process is eventually developed.

122. *Comment:* We are supportive of holding public hearings but do not believe you should limit it to just the local area. The definition of a unique waters says that a unique water means a surface water that has been classified as an outstanding state resource water.

Response: ADEQ is not limiting public participation or public hearings to the local areas of proposed unique waters. ADEQ added a provision to the unique waters rule stating that it would hold at least one public hearing in the local area of a nominated unique water to solicit public comment on the nomination. However, this does not mean that ADEQ is limiting public participation only to those public meetings. Unique water classifications must be done by rulemaking. Consequently ADEQ conducts public hearings to take public comments on revisions to the surface water

quality standards rules, including unique waters nominations. These general public hearings are usually conducted in Arizona's major metropolitan areas, including Phoenix, Tucson, and Flagstaff. ADEQ agrees that decisions on unique water classifications are of interest to persons throughout the state and not just in locally affected communities. ADEQ has provided opportunities for the public to participate in both formal and informal rulemaking activities by scheduling public hearings to take comment on preliminary draft rule proposals, including unique water nominations. ADEQ has scheduled public meetings throughout the state for the sole purpose of discussing proposed unique waters. ADEQ expects that these public participation procedures will continue to be used in future triennial reviews.

123. *Comment:* In general, it is recommended for the more challenging nomination requirements to include a qualifier (for example, "to the extent feasible," "with explanation for omissions," "proposed for later submissions"). Such qualifiers would enable the average citizen nominator to make an initial case for a nomination, but not necessarily an exhaustive case that conclusively meets unique waters criteria. ADEQ should allow the submission of additional documentation that is later requested by ADEQ and within a deadline set by ADEQ.

Response: ADEQ disagrees that qualifiers need to be included in the final rule because the specific information requirements that commenters took issue with are not included in the final rule. ADEQ agrees that there should be an opportunity to supplement a nomination and provide additional documentation to ADEQ during an informal review period.

124. *Comment:* Change R18-11-112(C)(3) from "demonstrating that one of the applicable ..." to "demonstrating that one or both of the applicable..." Presumably a nomination eligible under both conditions can be submitted, processed, and found eligible for unique waters classification, even if one condition should not be found compelling.

Response: ADEQ agrees that a nomination may be based on exceptional ecological significance, exceptional recreational significance, or both. The final rule is written in a way that allows one or both grounds for unique waters classification [See R18-11-112(D)(4)].

125. *Comment:* It is inappropriate to propose the Arizona River Assessment Project methodology, criteria, forms, etc. as well as to initially require in a nomination such extensive research (for example, level of use, quality of water-dependent activities) when (a) this extensive effort may come to naught on the basis of some later-revealed ineligibility, (b) a copy of the methodology has not been provided to the public, and (c) the methodology has not been subject to previous public comment, review and ADEQ-public exchange. It is suggested that the proposed mandatory Project methodology be dropped, or at the very least, be made optional, and a general criteria, included examples, be presented that does, for example, require high frequency use as a universal criteria. If optional Project methodology is to be included, add "to the extent feasible."

Response: ADEQ agrees that it is inappropriate to require the use of the Arizona River Assessment Project (ARAP) methodology or forms. ADEQ did not prescribe the use of ARAP requirements in the final rule.

126. *Comment:* ADEQ proposes to add several requirements to exceptional recreational significance to R18-11-112(D)(1) defining "exceptional recreational significance" apparently to be exclusively based on high frequency use (i.e., numerous visitor days). It is reasonable to have high frequency as one criteria, but not the exclusive criteria. The rule does not specify any frequency of use under recreational significance, which is required to have unique recreation attributes (e.g. fishing, photography, birding). The proposed criteria is unfair in that it has evidently not been previously submitted to the public for comment and review and the proposed rule does not provide a complete copy of the Arizona River Assessment Project proposed to be the criteria. This submission to the public would be in keeping with the ADEQ desire for public review in another important element. That is, "the triennial review process is a better administrative process (i.e., than the Continuing Planning Process) for obtaining adequate public review of the state's antidegradation implementation procedures. If complexity, controversy, time constraints, the effort that gone into the depth and 214-page length of the proposed rule, and / or a potential large number of highly interested parties wishing to comment have contributed to the ADEQ decision not to propose Tier 3 final regulatory guidelines in this triennial, fairness calls for ADEQ not to propose final regulatory guidelines for "exceptional recreational significance" in this triennial. Without this public consideration, it is inappropriate for ADEQ to apply this high frequency criteria to the rationale used to find ineligible specific nominations in this triennial review including those of Pinto Creek, Haunted Canyon, the Dry Lake nomination, and those of the San Pedro River watershed four streams. A required high frequency recreational criteria is also unfair because it shuts out a significant segment of our citizens. Some places with unique attributes are not conducive to access by large numbers, but more by individuals and small groups (e.g. hikers, birders, researchers), a not inconsiderable number of the state population as measured by hiking clubs, Audubon membership who enjoy the unpaved outdoors. Such unique waters with small visitation are nonetheless worthy of preservation under an unique waters recreational criteria. It also is not reasonable. Reaches may have "exceptional recreational significance" regardless if recreationally enjoyed by a few or tens of thousands annually. It is contended that the quality of the recreational experience is the universal criteria for exceptional recreational significance, with frequency one of various considerations. It is suggested that the Arizona River Assessment Project methodology await implementation until a full consideration in the next triennial.

Response: The current unique waters rule states that a surface water may be classified as a unique water because it is of exceptional recreational significance because of its unique attributes, including but not limited to, attributes related to the geology, flora, fauna, water quality, aesthetic values, or the wilderness characteristics of the surface water. However, there is little guidance on how ADEQ should make a determination of exceptional recreational signifi-

cance. While the level or frequency of recreational use levels is not the exclusive criterion for making an exceptional recreational significance determination, it is a relevant factor that has been considered by agency decision-makers from the inception of the unique waters program. For example, the original Arizona Water Quality Council Unique Waters Policy (April 8, 1981) includes several secondary designation criteria that relate to recreational use levels. The original unique waters policy states that the Water Quality Control Council (WQCC) would consider “waters in which public recreational use exceeds the average annual use of similar or corresponding waters taken on a national or regional basis. In determining this use, such factors as relative accessibility and the type of recreation should be considered.” The WQCC also factored in non-resident recreational use of a surface water when making a unique waters determination. For example, the original policy states that surface waters “which attract 25% or more non-resident recreational users based on the annual public use” is a factor in unique waters designation process. It is clear that the WQCC also considered the quality of recreational experience provided by a surface water in the unique waters designation process. For example, the original policy states that the WQCC would consider surface waters “which, because of unique and rare attributes provide exceptional and valuable recreational opportunities. Such attributes include but are not limited to the geology, flora, fauna, size, aesthetic value and wildness of the water or its surrounding area.” Also, the WQCC considered “waters proposed for inclusion in the national land system because of their recreational opportunities (national recreation areas, wild and scenic rivers, wilderness areas, etc.).” These policy statements from the original unique waters policy make clear that levels of recreational use, frequency of use, relative accessibility, and the types of recreational opportunities provided have always been considerations in the agency’s “exceptional recreational significance” determination.

127. *Comment:* ADEQ says that if a nomination is based on “exceptional recreational significance,” the nominee must submit specific information about the plant species and plant communities associated with a surface water, with a list of dominant vegetation community, species diversity, species scarcity, the size of the riparian area, successional stage of the riparian community, relative predominance of natural and introduced vegetation, using the Arizona River Assessment Project methodology. Wildlife assessment, in part, is to include a “focus on obligate and facultative riparian wildlife.” As with previous comments, it is not fair that ADEQ implements a methodology without providing the public a copy in the proposed rule and not having previously opened it up to public comment. It is not reasonable to ask citizens in an initial nomination, regarding ecological significance due to an outstanding fishery to submit specific information on all the requirements that run 21 lines in the proposed rule (e.g., the fish species present, significance of the fish species present, population inventory, a fish inventory). It is not contended that such information not be a part of a complete administrative record, but that initially it not be mandatory. Again, such complex and lengthy information has the effect of shutting out citizen nominations or requiring hiring an expensive consultant to gather data, which may be found irrelevant due to a later-revealed ineligibility of the nominated reach. It is proposed that after a first stakeholders meeting on the initial nomination, that ADEQ then, in collaboration with the nominator and possibly other stakeholders / agencies, clarify what additional information is needed, assist the nominator in its development (e.g., suggest possible sources of information or possible funding). It is inappropriate for ADEQ to ask citizens in an initial nomination to adhere to guidelines with such terminology as “obligate and facultative wildlife” and technical concepts such as stream modeling. Does ADEQ believe the average citizen-nominator will understand what is being asked, let alone have the means to comply? ADEQ should provide user-friendly wording in its unique waters criteria and distinguish between what is required in the initial nomination from what is required in the final administrative record. The point is not to dilute the compilation of a complete administrative record, but also not to require information akin to a Ph.D. doctoral thesis in a nomination either. Encourage serious nominations with sufficient initial, documented data that allows ADEQ to make a preliminary decision of initial eligibility and of possible final eligibility if specified additional data is provided.

Response: ADEQ agrees and did not require the submittal of information from the Arizona River Assessment Project methodology or forms.

128. *Comment:* ADEQ defines uniqueness or rarity of unique habitat as one of the 5-10 best examples of the type in the state. This is not reasonable. Five to ten is too limiting. ADEQ specifically mentioned habitat for the endangered Apache trout in as many as eight of the unique waters nominations in the Apache-Sitgreaves National Forest. Presumably, there are more than 10 such habitats in the state, yet, for an endangered native fish, this may not be numerous. And, if a 21st habitat is found in a future-nominated reach for Apache trout, even with 20 other examples in the state, ADEQ should not necessarily rule out a 21st site for consideration. Also, the 5-10 examples need to be more carefully defined. ADEQ asserts that Haunted Canyon does not possess outstanding attributes to set it apart as a surface water of statewide significance, but does not indicate if it did so on the basis of uniqueness in a 3300’ altitude zone. How common in other arid high desert sites in the state are the 95% canopy cover, the presence of migratory neotropical birds, the massing of thousands of birds in 1995, the presence of the normally higher altitude mountain kingsnake, an Abert squirrel, 16.1 acres of riparian vegetation in a .7 mile stretch of perennial water?

Response: The reference to the 5-10 best examples of the habitat type in the state in the preamble discussion of the meaning of “exceptional ecological significance” is intended to explain ADEQ’s interpretation of the meaning of “exceptional ecological significance” when habitat is one of the grounds for a unique waters classification. It is provided as a guideline, not as a bright-line criterion.

The reasons for ADEQ’s not proposing or classifying Lower Haunted Canyon as a unique water are fully explained in the preamble. ADEQ agrees with the commenter that the stream is a valuable surface water resource and ecologically significant. However, ADEQ did not propose Lower Haunted Canyon as a unique water because: 1) the absence of

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federally-listed endangered or threatened species, 2) the opposition of the Tonto National Forest to a unique waters classification, 3) and the potential for interference with a mitigation strategy to preserve in-stream flows in Lower Haunted Canyon.

129. *Comment:* ADEQ states that the presence of suitable habitat for a threatened or endangered species is insufficient by itself to support a unique waters nomination. The predominant reason given for eight nominations in the Apache-Sitgreaves National Forest appear to be Apache trout habitat, and, in one instance, Gila trout habitat, as opposed to the presence of these trout in all eight. Please provide the primary basis on which these eight were found eligible. It is understood that the recommendation of another agency is positive and important and that it and management capability are critical secondary factors, but neither appear paramount in the proposed rule.

Response: The primary basis for unique waters classification for the streams in the Apache-Sitgreaves National Forest is the presence of Apache trout and Gila trout and / or exceptional or good habitat for these endangered native fish. The support of the primary land management agency, the Apache Sitgreaves National Forest, and the ability to manage these streams to maintain and protect existing water quality were important factors in the decision to classify the streams as unique waters.

130. *Comment:* ADEQ states in the preamble that Pinto Creek is a small, perennial stream that flows through the Sonoran desert in Gila County near Globe, Arizona. Is Pinto Creek “small”? Is 36 miles “small” for an arid high desert Arizona stream? It has its own watershed, which covers 178.2 square miles, has major tributaries including Powers Gulch, Haunted Canyon, West Fork of Pinto Creek, Horrel Creek, Willow Spring Creek and Campaign Creek, itself which drains 78.4 square miles and is 17 miles long. Pinto Creek is spanned by two highway bridges 500 feet in length on US 60 near Top-of-the-World and State Highway 88 several miles south of Roosevelt.

Response: When ADEQ used the word, “small,” to describe Pinto Creek in the preamble, ADEQ was not thinking of the size of its watershed or the length of the stream. Rather, ADEQ was thinking primarily of its stream flow. Other groups (including groups cited by the Friends of Pinto Creek that provided supporting information for the lower Pinto Creek nomination) describe Pinto Creek as small. For example, the Arizona Rivers Coalition describes Pinto Creek as “a small free-flowing stream surrounded by Sonoran desert habitat” in *Arizona Rivers, Lifeblood of the Desert, A Citizen’s Proposal for the Protection of Rivers in Arizona*. ADEQ agrees that “small” may be an inaccurate descriptor of Pinto Creek because of the length of the stream and the size of its watershed. For this reason, ADEQ deleted “small” from the description of Pinto Creek in the preamble of Notice of Final Rulemaking.

131. *Comment:* ADEQ states in the preamble that Pinto Creek is perennial. Pinto Creek is not perennial, parts of it are.

Response: ADEQ agrees that Pinto Creek has both ephemeral and perennial reaches. ADEQ states in the preamble to the Notice of Final Rulemaking that Pinto Creek is ephemeral in its upper reaches but flows perennially in several reaches between its headwaters in the Pinal Mountains and Roosevelt Lake.

132. *Comment:* ADEQ states in the preamble that the *only* endangered or threatened species identified in the nomination are the bald eagle, southwestern willow flycatcher, the lesser long-nosed bat, and the Arizona hedgehog cactus and that other species are either candidate species or Forest Service-sensitive species. The use of the word, “only,” suggests that ADEQ has a minimum number of threatened and endangered species in mind that the nominator is to meet. Under the threatened and endangered species condition, R18-11-112(d)(4)(b), would not one be enough? The predominant reason for the ADEQ finding of eligibility for up to eight Apache Sitgreaves National Forest stream nominations appears to be on the basis of a suitable habitat for one endangered species, the Apache trout, and not necessarily based on its presence. This suggests that one is enough. Of course, wildlife other than threatened and endangered species are factors.

Response: ADEQ did not mean to suggest that there is a minimum number of threatened or endangered species that must be present before a stream will be considered for unique waters classification. The presence of one endangered or threatened species in a nominated surface waters is enough to support consideration of a surface water for unique waters classification under the unique waters rule [See R18-11-112(D)(2) of current surface water quality standards rules]. Under the current rule, the Director may classify a surface water as a unique water based on the finding that a threatened or endangered species is known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of the species or the surface water provides critical habitat for a threatened or endangered species. ADEQ deleted the word, “only,” from the preamble discussion to avoid confusion over this issue.

133. *Comment:* ADEQ states in the preamble that special status wildlife species or other wildlife species of concern are not located in the vicinity of the Carlota project area or suitable habitat is not present. ADEQ takes this citation from the Carlota project FEIS out of context. It refers to an immediately preceding list of 14 species not located in or near the Carlota Mine project area. These are: Chiricahua leopard frog, desert tortoise, common chuckwalla, Mexican garter snake, narrow-headed garter snake, northern goshawk, the cactus ferruginous pygmy owl, buff-breasted flycatcher, California leaf-nosed bat, Mexican long-tongued bat, the red bat, the southern yellow bat, the spotted bat, and the Yavapai Arizona picket mouse. As pointed out in the nomination and in the FEIS, Tonto National Forest addresses eight terrestrial species which it found associated with the project area and which are listed or proposed for listing as federally endangered or threatened. To this, I added five more, citing FEIS references. The thirteen are listed here. Ten were spotted in or near the project area, some five miles from the lower Pinto nominated reach, and in some

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instances in the lower Pinto nominated stretch: 1) Arizona hedgehog cactus, 2) Arizona toad, 3) Lowland leopard frog, 4) Common black hawk, 5) Yellow-billed cuckoo, 6) Loggerhead shrike, 7) Longfin dace, 8) Desert sucker, 9) Maricopa tiger beetle, 10) Southwestern Cave Myotis (bat), 11) bald eagle, 12) Southwestern willow flycatcher, and 13) Lesser long-nosed bat.

Response: ADEQ agrees that the presence of special status species or other wildlife species of concern are relevant to a determination of whether a nominated surface water should be classified as a unique water on the ground that the surface water is of exceptional ecological significance. However, even if all of the 13 species listed in the comment are present in lower Pinto Creek, it would not have changed ADEQ's decision not to classify a § 303(d) listed surface water as a unique water.

134. *Comment:* ADEQ states that the availability of suitable habitat and the assertion [i.e., by U.S. Fish & Wildlife] that a threatened or endangered species may be present are insufficient to support a unique waters classification under R18-11-112(D)(2). R18-11-112(D)(2) refers to surface water in a free-flowing condition. ADEQ may refer to R18-11-112(D)(4)(b) threatened and endangered species, but the reference is pertinent to R18-11-112(D)(4)(a) under exceptional recreational significance with regard to wildlife and scenic values. It is not argued that the U.S. Fish and Wildlife position is the prime basis for classification under "exceptional recreational significance," but it is contended that it be scored as one point in favor, without criticism, as a possible "unique wildlife and scenic" attribute. It is noted that ADEQ presents suitable habitat for the Arizona trout, which is documented to be not present as the paramount reason for a half dozen unique water designations in this triennial cycle and that ADEQ gives considerable weight to other agency views.

Response: Under the current unique waters rule, R18-11-112, a person may nominate a surface water as a unique water based on one of the following grounds: 1) the surface water is of exceptional recreational or ecological significance because of its unique attributes, including but not limited to, attributes related to the geology, flora, fauna, water quality, aesthetic values, or the wilderness characteristics of the surface water [See R18-11-112(D)(1)] or, 2) threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species or the surface water provides critical habitat for a threatened or endangered species. See R18-11-112(D)(2).

When ADEQ stated in the preamble to the proposed rules that "[t]he availability of suitable habitat and the assertion that threatened or endangered species *may* be present are insufficient to support a unique waters classification under R18-11-112(D)(2)," (emphasis added) ADEQ was referring to the second ground for unique waters classification relating to threatened and endangered species stated in the above paragraph (hereafter referred to as the "T&E species ground"). Several findings must be made before a surface water may be classified on the T&E species ground. First, ADEQ must find that a threatened or endangered species *is known to be associated with a surface water*. The possible presence of a threatened or endangered species (as indicated by the use of the phrase "may be present") does not meet the test of a known association with a surface water required by R18-11-112(D)(2). Second, ADEQ must find that existing water quality is essential to the maintenance and propagation of a threatened or endangered species that is known to be associated with the surface water. In the alternative, there must be enough information to support a finding that a threatened or endangered species is known to be associated with a surface water and the surface water provides critical habitat for the threatened or endangered species.

When ADEQ stated in the preamble that the availability of suitable habitat and the assertion that threatened or endangered species *may* be present was insufficient to support a unique water classification, ADEQ meant that it could not make the finding required by R18-11-112(D)(2) that a threatened or endangered species was known to be associated with lower Pinto Creek. Also, the "availability of suitable habitat" for a threatened or endangered species would not be enough to support a finding that a nominated surface water provides *critical habitat* for threatened or endangered species. Available suitable habitat and critical habitat are not the same. "Critical habitat" is a term of art under of the Endangered Species Act. There must be a critical habitat designation by the U.S. Fish & Wildlife Service to meet the critical habitat test in R18-11-112(D)(2). ADEQ agrees that the presence of Forest Service-sensitive species, federal candidate species, state-listed threatened or endangered species, or state candidate species can be used to make a case for unique waters classification on grounds of "exceptional ecological significance."

ADEQ also agrees that the presence of rare and uncommon species of plants or wildlife is important to certain types of recreation (e.g., birdwatching, nature study) and should be taken into consideration. The current rule states that a surface water may be of exceptional ecological or recreational significance because of unique attributes such as the flora and fauna associated with the surface water. In general, ADEQ thinks the presence of Forest Service sensitive species and candidate species are more relevant to the determination of "exceptional ecological significance." However, ADEQ agrees that the presence of Forest Service-sensitive species, federal candidate species, state-listed endangered species, or state candidate species are relevant factors to the agency's determination of "exceptional recreational significance." ADEQ does not believe that they are primary factors in the recreational significance determination. ADEQ interprets recreational significance primarily in terms of recreational opportunities provided by a stream. In other words, what types of recreation are available or enhanced by the stream, what is the quality of the recreational experience, and what are the levels of recreational use.

135. *Comment:* ADEQ states that the bald eagle, hedgehog cactus, and southwestern willow flycatcher are weakly associated with Pinto Creek. Under the threatened and endangered species condition, point taken. Under the exceptional ecological significance condition, it is suggested that possible overflight of the bald eagle from nesting places

15 miles distant be scored as one minor point regarding a possible “unique scenic and wildlife” attribute, the presence of the endangered hedgehog cactus scored as one point for a scenic attribute, and the possible return of the endangered southwest willow flycatcher be credited as suitable habitat for an endangered species now nesting in Lake Roosevelt some ten miles from lower Pinto Creek. Such would be in keeping with the ADEQ consideration of suitable habitat for the endangered Apache trout, the apparent reason for an eligibility finding in up to eight ADEQ unique water designations.

Response: ADEQ agrees that the possible overflight of bald eagles, the presence of the hedgehog cactus, and the possible return of southwest willow flycatcher are relevant points that help make a case for classification of lower Pinto Creek as a unique water on grounds of exceptional ecological significance. However, ADEQ felt that these points were outweighed by the listing of lower Pinto Creek as an impaired surface water on Arizona’s § 303(d) list, the opposition of the Tonto National Forest to unique waters classification, the relative weaknesses of the arguments for classification on grounds of exceptional recreational significance or the known association of threatened or endangered species.

136. *Comment:* Under “exceptional ecological significance,” ADEQ refers to the more than 20 endangered, threatened, or sensitive species cited in U.S. Forest Service and other documentation, the perennial water, the outstanding cottonwood-willow riparian corridor, outstanding scenic values, exceptionally remarkable ecological values because of its cottonwood-willow riparian community, the rarest riparian community on the Tonto National Forest, the good riparian community in the lower half of the nominated segment where no cattle had grazed, the high value of the riparian area as a benchmark for documenting the recovery of the cottonwood-willow riparian community and that the trend of the riparian community was improving. Elsewhere, ADEQ noted that Tonto National Forest considered this perennial segment of the stream eligible for Wild & Scenic River classification based on “exceptional remarkable scenic, riparian, and ecological values” and determined that the reach was eligible for classification as scenic. ADEQ could have cited per the nomination and in keeping with ADEQ citations of the Nature Conservancy and other agencies that a) the Arizona Congressional delegation requested a Wild and Scenic River study, b) the Arizona Rivers Coalition recommended a somewhat larger portion for this status and the U.S. Forest Service found it eligible for Wild and Scenic River status, c) American Rivers placed Pinto Creek on its top ten list of most endangered streams an unprecedented three years running, (d) EPA declared Pinto Creek “an aquatic resource of national importance,” a designation given only seven times since it was established in 1992, (e) Senator Barry Goldwater called Pinto Creek a “gem” and a shame to lose, (f) the tree over-story is dense, varying 50-77%, providing important habitat for breeding neotropical birds, a percentage five to seven times the average found in a reach of the Middle Pinto, and (g) an unusual geological feature marks the end of the nominated stretch, a narrow quarter-mile canyon some 100 feet high.

Response: ADEQ agrees that the factors cited in the comment provide relatively strong support for a unique waters classification for lower Pinto Creek on grounds that the creek is of exceptional ecological significance. ADEQ’s decision not to classify lower Pinto Creek as a unique water in this triennial review should not be construed as a complete rejection of the merits of the Pinto Creek nomination on this ground. On the contrary, ADEQ specifically agreed with the nominators that Pinto Creek has important natural resource and ecological values, noting the presence of perennial water in a desert environment and the relatively rare cottonwood-willow riparian community that Pinto Creek supports. The preamble to the Notice of Final Rulemaking clearly documents that ADEQ considered the arguments made in support of the nomination of Pinto Creek, including the presence of 20 endangered, threatened, or sensitive species; the creek’s outstanding cottonwood-willow riparian corridor; its geological features, and its scenic values. ADEQ specifically acknowledges in the preamble that the U.S. Forest Service determined that the nominated segment of Pinto Creek was eligible for inclusion in the national Wild & Scenic Rivers system as a scenic river and that the stream possessed “outstandingly remarkable” scenic, riparian, and ecological values. ADEQ does not disagree fundamentally with this assessment. However, ADEQ’s decision not to classify Pinto Creek as a unique water was based primarily on other factors that ADEQ felt outweighed the arguments for classification. While the U.S. Forest Service (USFS) determined that Pinto Creek was potentially eligible for inclusion in the Wild and Scenic Rivers system, that determination was based on a preliminary analysis and Congress has not acted, as yet, on the USFS recommendation. It also should be noted that the Tonto National Forest, the agency with responsibility for managing the public lands through which Pinto Creek flows and which provided information for the preliminary analysis of eligibility of Pinto Creek for Wild & Scenic River designation, did not support unique waters classification for lower Pinto Creek.

ADEQ’s decision was based primarily on the identification of Pinto Creek as a water quality impaired stream that is currently listed on the state’s § 303(d) list and for which a TMDL is being developed. ADEQ believes that the identification of a surface water as an impaired water and inclusion on the § 303(d) list is fundamentally inconsistent with a unique waters classification. ADEQ also considered the relative weakness of the case that threatened or endangered species are known to be associated with lower Pinto Creek. No showing was made that existing water quality was essential to the maintenance and propagation of a T&E species or that Pinto Creek provided critical habitat for a T&E species. ADEQ was not persuaded that a strong enough case was made that Pinto Creek was of “exceptional recreational significance” given the recreational opportunities provided by Pinto Creek, the level of recreational use, and the limited public access to the area.

137. *Comment:* Arguing against the nomination on the basis of the reach being of “exceptional recreational significance,” ADEQ cites the only fair condition of the riparian community on the upstream half of the nominated segment. The “only fair condition” comment should be viewed in the context that it pertained to the overall Tonto National

Forest assessment of the outstandingly remarkable scenic and ecological values and did not prevent the Tonto National Forest from finding the entire 8.8 mile segment, including this “only fair” upstream half to be of outstanding remarkable scenic, riparian and ecological values. ADEQ noted that more recent information of the status of the riparian community for the lower Pinto Creek nominated stretch was not included except for a brief note reporting the personal observations of the nominator that he observed dense thickets of young cottonwoods during a June, 1999 hike. Consideration should be given to ADEQ’s deadline of August, 1999 for submission of nominations and so subsequent observations are not included, b) the 1999 nomination was made without the benefit of the March, 2001 proposed rule change, which although it too does not have any direct emphasis on current information, does directly request current property information, and indirectly seeks current information by way of its requirements for plant and wildlife field surveys, stream modeling, completion of the Arizona River Assessment Project methodology, etc., c) that ADEQ, if it wanted more current information, could have requested this early on from the nominator, albeit that neither the current rules nor the proposed rule address this procedure as does my proposed schedule. Whereas, it is too late to conduct extensive seasonal visits, I would note that: 1) As more recent indication that lower Pinto Creek is perennial, water flowed at ADEQ’s Henderson Ranch observation station, located approximately at the mid-point of the nominated stretch, in the years 1994-1999, 2) a bird study conducted by a naturalist in lower Pinto Creek and Haunted Canyon in 1996, 1997, 1999, and 2000 identified 47 species present, 3) a professional ethnobotanist and professional birder with over a 3000+ life list reviewed the study and commented, and 4) ADEQ did not provide a finding on the eligibility under “exceptional ecological significance” condition of the lower Pinto nominated reach. Is it? If so, it is recognized that if one of the two conditions is met, the Director may, not must classify a reach as a unique water. If not, please explain why Pinto Creek does not qualify. Why is eligibility alone for Wild & Scenic River designation, the criteria of which is proposed for modeling ADEQ criteria after, not sufficient for the “exceptional ecological significance.” How many other unique water streams, existing or currently proposed, have Wild & Scenic Rivers classification?

Response: ADEQ did not make a finding that lower Pinto Creek is of exceptional ecological significance and will not make a finding in this responsiveness summary. ADEQ did not make specific findings for nominated surface waters that ADEQ decided not to propose for unique waters classification in this triennial review. Under the current rule, ADEQ has discretion to classify a surface water as a unique water. The current rule states that ADEQ *may* classify a surface water as a unique water based upon a finding of exceptional recreational significance, exceptional ecological significance, or because there is a known association of threatened or endangered species with the surface water and the existing water quality is essential to the maintenance and protection of the threatened or endangered species. ADEQ interprets the current rule to mean that ADEQ can decide not to classify a surface water as a unique water *even where adequate grounds exist for a unique waters classification*. ADEQ cannot abuse its discretion and the agency cannot act arbitrarily and capriciously. However, if there is a rational basis for an ADEQ decision not to propose a surface water as a unique water, then there can be no abuse of discretion. In the case of the lower Pinto Creek nomination, ADEQ articulated its reasons for not proposing the stream as a unique water. The agency’s decision not to classify the stream as a unique water was based primarily on the fact that Pinto Creek was identified as an impaired surface water and included on Arizona’s § 303(d) list. While proponents of the Pinto Creek nomination may disagree with ADEQ’s reasoning, the agency decision has a rational basis and it is not arbitrary or capricious.

While ADEQ did not make a specific finding that lower Pinto Creek is of exceptional ecological significance in this triennial review, ADEQ can say in response to the comment that lower Pinto Creek is eligible for unique waters classification on that ground because of the presence of perennial water, the presence of many Forest Service-sensitive species, state and federal candidate species for listing as threatened or endangered species, its cottonwood-willow riparian community, and its geological features.

138. *Comment:* If ADEQ does not find Pinto Creek eligible under the exceptional ecological significance condition, please assure the nominator that ADEQ is not holding the lower Pinto Creek nomination to a higher standard than Stinky Creek that is proposed for unique waters classification. The text states that (a) the Apache Sitgreaves National Forest (ASNF) said “road closures and exclusionary fencing have improved this stream to good condition,” (b) ASNF supported the nomination along with the Arizona Game & Fish Department, and (c) the stretch was capable of being managed. The introduction of the threatened Apache trout to Stinky Creek was not specifically mentioned, but a general condition for up to all eight nominations in the Apache Sitgreaves National Forest appeared later in the proposed rule text, so perhaps suitable habitat is an additional criteria, one presumably paramount. For the record, I support the ten new ADEQ unique water designations in the proposed rule.

Response: Each surface water proposed for unique waters classification was evaluated on its own merits. No nomination was held to a higher standard than another.

139. *Comment:* ADEQ states in the preamble that lower Pinto Creek does not qualify for unique waters classification on the ground that the stream is of exceptional recreational significance, with recreational activities limited to dispersed recreation activities such as hiking, nature study, picnicking, and horseback riding. It is not fair to require all “exceptional recreational significance” to high frequency use and multiple recreational activities. Recreational significance exists, whether enjoyed by a relatively few, as is the case of lower Haunted Canyon or by many, as at Lake Roosevelt. I personally have hiked 2/3 of the lower Pinto nominated stretch and am overwhelmed by the variety of terrain, vegetation, in-creek and surrounding rock formations, and pools of water in the stream. The proposed rule for “exceptional ecological significance” does not limit unique attributes of wildlife, scenic values, riparian vegetation, hydrology, and geology to places highly frequented nor to commercial / multiple recreational uses. Hence, it may

include dispersed recreational hiking, camping, birding, and the thousands of people involved in numerous hiking and birding classes, clubs, and associations in the state.

Response: ADEQ believes that the types of recreational opportunities provided by a surface water and the level of recreational use are relevant factors that should be considered when ADEQ makes a determination as to whether a surface water is of “exceptional recreational significance.” ADEQ did not use the level of recreational use or the diversity of recreational opportunities provided by a surface water as the only determinants of “exceptional recreational significance.” ADEQ agrees that the quality of a recreational experience provided by a surface water is a relevant consideration when making an exceptional recreational significance determination. While ADEQ agrees that the scenic qualities of lower Pinto Creek and its riparian corridor, its birdwatching and wildlife viewing opportunities, the geology of the Pinto Box, and its cultural resources support a determination that Pinto Creek is recreationally significant, those arguments are counterbalanced by the relatively infrequent use of the area for recreation, the difficulty of access, the lack of developed trails or campsites, and the limited recreational opportunities provided by stream.

140. *Comment:* The proposed rule limits recreational significance to adherence to the Arizona River Assessment Project’s unknown but presumed high frequency methodology of a five-class assessment. It is contended that such adherence should properly await public review of a copy of the methodology, discussion at public meeting, and comment. For this triennial, it is recommended that the methodology may be one option, but not the exclusive one for a finding of exceptional recreational significance.

Response: ADEQ agrees and did not apply the Arizona River Assessment Project (ARAP) methodology to evaluate recreation resources to the surface waters nominated for unique waters classification. While ADEQ discussed the use of the ARAP methodology and its assessment rating in the proposed rules, ADEQ was persuaded not to use the ARAP evaluation method by public comments. However, ADEQ did consider the independent assessment of lower Pinto Creek by the Arizona River Assessment Project in its decision. ARAP assessed Pinto Creek as a limited recreation resource.

141. *Comment:* ADEQ decided not to propose Pinto Creek for unique waters classification primarily because the stream is water quality-limited for dissolved copper and the stream is listed on Arizona’s § 303(d) list. ADEQ believes that the current § 303(d) listing is inconsistent with a unique waters classification. Is this § 303(d) determination based on a technicality? How can it be said that “the stream is water quality-limited for dissolved copper” when ADEQ is aware that there is no copper exceedance or other § 303(d) stream impairment in the lower Pinto Creek nominated stretch? No exceedances were found at Henderson Ford, approximately at the midpoint of the lower Pinto nominated stretch in 25 samples taken in 6 consecutive years, 1994 -1999. No additional target sites were established downstream of the Pinto Valley weir (i.e., immediately upstream of the segment eligible for Wild & Scenic River designation) because an evaluation of the water quality data at the weir suggests that water quality criteria are currently being met at this location and that no significant sources of dissolved copper are known below this site. After Spring, 2002, lower Pinto Creek, including the nominated stretch, will see its § 303(d) classification lifted. Given that ADEQ primarily did not designate Pinto Creek for unique waters because of its § 303(d) listing, please comment on the following: 1) When Pinto is technically not listed under § 303(d) as of the Spring, 2002, does the stretch become eligible for a unique waters listing? 2) Why then is the nominated stretch not now proposed eligible for unique waters with the contingency that the § 303(d) listing is removed in the Spring, 2002? 3) Alternatively, why is the § 303(d) listing, evidently inapplicable since at least 1994, not removed now? Or declared now to not be eligible when the next § 303(d) de-listing occurs? 4) In light of the lack of § 303(d) impairment at the August, 1999 time of submission of the nomination, why is the proposed rule’s new ineligibility if there is a § 303(d) listing applied retroactively to the lower Pinto nomination? Why cannot ADEQ find that now § 303(d) listing ineligibility is not applicable retroactively in this instance to an unimpaired stream reach nominated under rulemaking of the previous triennial that did not contain the § 303(d) ineligibility listing?

Response: Pinto Creek, including the nominated segment of lower Pinto Creek, is listed on Arizona’s current § 303(d) list of impaired waters. Pinto Creek has not been segmented nor has lower Pinto Creek been “de-listed.” As stated in the preamble, ADEQ believes that a § 303(d) listing and unique waters classification are fundamentally inconsistent with each other. ADEQ has discretion to classify surface waters as unique waters under the current rule and ADEQ exercised its discretion in a way consistent with this stated position. While the proponents of a unique waters classification for Pinto Creek can argue that the current listing of Pinto Creek is improper or based on a technicality, the fact remains that all of Pinto Creek is currently on Arizona’s § 303(d) list of impaired waters. ADEQ will not consider a unique waters classification for Pinto Creek until the entire stream or segments of the stream are actually de-listed. The ineligibility of a surface that is on the § 303(d) list is one of the few “bright line” criteria that ADEQ has identified to guide decision-making in the unique waters classification process. It is a rational and reasonable criterion that provides some regulatory certainty that ADEQ has included in both the proposed and final rules.

It would be inappropriate for ADEQ to propose a surface water for unique waters classification in anticipation of a potential de-listing action. The danger of trying to predict what may happen in the § 303(d) regulatory arena is illustrated by ADEQ’s recent experience with the TMDL rulemaking. ADEQ recently terminated the rulemaking relating to § 303(d) listing and de-listing in December, 2001. The target date for publishing a revised § 303(d) list is no longer Spring, 2002. The target date for a revised list has been moved back to October, 2002. While ADEQ intends to re-propose § 303(d) listing and de-listing rules in 2002, ADEQ cannot predict the outcome of that rulemaking process or whether Pinto Creek or segments of Pinto Creek will be removed from the current § 303(d) list. ADEQ will not con-

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sider a unique waters classification for a surface water that is on the current § 303(d) list. The final rules submitted to the Governor's Regulatory Review Council clearly state ADEQ's position in this regard... a surface water that is listed as impaired pursuant to § 303(d) of the Clean Water Act is ineligible for unique waters classification [See R18-11-112(D)(3)]. If the final rule is approved by the Governor's Regulatory Review Council and becomes effective, Pinto Creek will be ineligible for unique waters classification for as long as it remains on the § 303(d) list. If Pinto Creek is segmented and the nominated segment of Pinto Creek is actually removed from the § 303(d) list, it will be eligible for unique waters classification. There is no provision for "contingent" eligibility in anticipation of a possible de-listing action.

ADEQ cannot remove Pinto Creek from the current § 303(d) list now. The revision of Arizona's § 303(d) list is on a separate schedule that is tied to biennial water quality assessments under § 305(b) of the Clean Water Act. The de-listing of Pinto Creek or segments of Pinto Creek is properly considered in the water quality assessment process that is governed by separate statutes and rules.

142. *Comment:* Does ADEQ believe that the current § 303(d) listing of a nominated stretch, which ADEQ water quality monitoring beginning in 1994 showed should not have been on the § 303(d) list, is "inconsistent" with a unique waters classification?

Response: Yes.

143. *Comment:* Is ADEQ suggesting that the nominator re-submit the nomination in the new triennial under the proposed rule's specific request for substantially more data which is of recent origin, from more varied sources, possibly involving field surveys and exhaustive research, with the ADEQ interpretation of Tier 3 applicability to lower Pinto Creek and lower Haunted Canyon Creek unclear, involving another round of Phoenix and Globe public meetings, public comments, etc? And to do so because a stream, unimpaired since 1994 (if not before then) is technically and inappropriately § 303(d) listed as a result of an internal ADEQ inaction, suspension of an ADEQ 2000 § 303(d) review procedure disallowing delisting prior to 2002?

Response: ADEQ is not suggesting any particular course of action to the Friends of Pinto Creek regarding re-submittal of the lower Pinto Creek nomination. Given ADEQ's stated position with regard to the eligibility of surface waters included on the § 303(d) list for unique waters classification and the explicit statement of ineligibility in R18-11-112(D)(3) of the final rule, ADEQ advises against the re-submittal of the nomination before a nominated segment is actually removed from the § 303(d) list. The re-submittal of the nomination prior to de-listing would have the same result. Of course, any person may nominate or re-submit a nomination of lower Pinto Creek if it is de-listed.

144. *Comment:* Is there another primary reason, not cited in the proposed rule, that the lower Pinto Creek nominated reach is not being proposed?

Response: No. ADEQ's reasons for not proposing Pinto Creek as a unique water are set out in the preamble to the Notice of Final Rulemaking. While the listing of Pinto Creek on Arizona's § 303(d) list of impaired surface waters was the primary factor in ADEQ's decision not to propose lower Pinto Creek as a unique water, there were other reasons for ADEQ's decision. These factors include: 1) The absence of support for unique waters classification by the Tonto National Forest, the federal agency with responsibility for managing the public lands through which lower Pinto Creek flows, 2) the weak association of endangered or threatened species with Pinto Creek, 3) ADEQ's judgement regarding the recreational significance of lower Pinto Creek, and 4) the level of controversy, lack of consensus regarding the Pinto Creek nomination, and the strong opposition from persons in locally-affected communities to unique waters classification of lower Pinto Creek.

145. *Comment:* Will future nominations of lower Pinto Creek and lower Haunted Canyon be allowed? The Arizona Silver Belt (July 4, 2001) said they would not in reporting an ADEQ-called public meeting in Globe on unique waters.

Response: Yes. Future nominations of lower Pinto Creek and lower Haunted Canyon may be made in a future triennial review. Under both the current rule and the proposed final rule, any person may nominate a surface water for classification as a unique water. The rule does not prohibit the re-submission of a nomination. Of course, re-submissions and future nominations of surface waters will be governed by the eligibility criteria in the final rule if it becomes effective law. If the final rules become effective, the eligibility criteria will include the following: 1) the surface water must be a perennial water, 2) the surface water must be in a "free-flowing condition" as defined by the final rule 3) the surface water must have good water quality, and 4) the surface water must meet one or both of the following conditions: 4) it is of exceptional recreational or ecological significance or 5) threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species or the surface water provides critical habitat for a threatened or endangered species. If the final rule becomes effective, a surface water that is listed as an impaired surface water on Arizona's § 303(d) will not be eligible for unique waters classification. Also, ADEQ will consider the factors set out in subsection (G) of the final rule when making a decision on whether to propose a nominated surface water as a unique water. These factors include whether there is ability to manage the proposed unique water and its watershed to maintain and protect existing water quality, the social and economic impact of unique waters classification, the public comments in support or opposition to a proposed unique water, the support or opposition of federal and state land management agencies, and whether the proposed surface water is located within a national or state park, national

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monument, national recreation area, wilderness, riparian conservation area, area of critical environmental concern, or has some other special use designation (e.g., Wild and Scenic River designation).

146. *Comment:* ADEQ states in the preamble that it does not agree that Lower Haunted Canyon possesses the outstandingly remarkable and unique attributes that qualify it as one of Arizona's outstanding state resource waters of exceptional ecological significance. ADEQ notes in its discussion that it does not have federally-listed threatened or endangered species. This absence does not disqualify lower Haunted Canyon from the exceptional ecological significance condition. R18-11-112(D)(4)(a) does not require the presence of threatened or endangered species, although they would, of course, enhance the list of unique attributes. The absence would disqualify lower Haunted Canyon from the "threatened and endangered species" condition, but it is not being discussed.

Response: It is true that the absence of federally-listed threatened or endangered species does not disqualify lower Haunted Canyon from consideration as a unique water. The known association of threatened or endangered species is only one of the grounds for unique waters classification. A surface water like lower Haunted Canyon may be classified as a unique water on grounds of exceptional recreational or ecological significance. These independent grounds for unique waters classification do not depend on the presence of federally-listed threatened or endangered species.

ADEQ's decision not to classify lower Haunted Canyon as a unique water was based on several grounds. While ADEQ agreed that lower Haunted Canyon may be an ecologically significant surface water, ADEQ decided that the stream did not represent one of the state's outstanding state resource waters of exceptional ecological significance. ADEQ attempted to explain this decision by references to the decision criteria in the current rule. ADEQ noted the absence of federally-listed threatened or endangered species. While the commenter is correct that the exceptional ecological significance determination does not require a finding of a known association of a federally-listed threatened or endangered species, the absence of threatened or endangered species is still a relevant factor in determining ecological significance. ADEQ also found that lower Haunted Canyon was not of exceptional recreational significance because of the difficulty of access and the limited recreational use of the area. ADEQ also considered the opposition of the Tonto National Forest, the federal agency responsible for managing the public lands where lower Haunted Canyon is located, to the nomination of lower Haunted Canyon as a unique water.

147. *Comment:* ADEQ states in the preamble that the absence of threatened and endangered species and the presence of non-native fish species in Lower Haunted Canyon suggests that the stream is representative of other small, desert streams. Is it ADEQ's view that the absence of threatened or endangered species and the presence on non-native fish species are the primary or essential criteria to find lower Haunted Canyon representative of other small, desert streams? That this absence or presence in the context of the 17 unique attributes listed below categorize lower Haunted Canyon as representative (that is, common) among other small, desert streams? 1) Haunted Canyon's suitable habitat for two endangered species, 2) presence of Arizona hedgehog cactus (endangered, state endangered, U.S. Forest Service sensitive), 3) presence of the desert sucker and longfin dace, both of which are U.S. Forest Service sensitive species, 4) presence of the Arizona toad (endangered candidate), 5) presence of the lowland leopard frog (endangered candidate, state candidate, U.S. Forest Service sensitive species) 6) presence of the common black hawk (state candidate, U.S. Forest Service sensitive), 7) presence of yellow-billed cuckoo (state threatened), 8) presence of loggerhead shrike (endangered candidate), 9) presence of the southwestern cave Myotis in the area, 10) possible presence of the lesser long-nosed bat (endangered, state endangered, U.S. Forest Service sensitive), 11) presence of 47 species of birds in lower Haunted Canyon, a winter home for thousands of birds, 12) sighting of an Eared Trogon in lower Haunted Canyon, 13) Lower Haunted Canyon meets sensitive habitat requirements for a number of special and threatened birds including the common black hawk, yellow-billed cuckoo, shrike and trogon, 14) presence of one of Arizona's finest stands of Arizona cypress, 15) tree density with a "spectacular" level of 95% deciduous canopy cover, 16) Tonto National Forest described Haunted Canyon as having the highest quality riparian habitat, and 17) Haunted Canyon, lower Pinto Creek and Seven Springs are among the very few public land perennial hiking streams available near Phoenix (a unique scenic attribute and recreationally significant).

Response: ADEQ agrees that Lower Haunted Canyon is ecologically significant because of its perennial water, riparian habitat, and the presence of Forest-sensitive, state-listed endangered and threatened species, and federal and state candidate species. However, for the reasons stated in the preamble and in the agency responses to public comments, ADEQ did not classify Lower Haunted Canyon as a unique water on the ground of exceptional ecological significance.

148. *Comment:* ADEQ rejects lower Haunted Canyon, as it did lower Pinto Creek, on the grounds that it is a lightly used recreational area. ADEQ appears to require any "exceptional recreational significance" to include high-frequency use and many varied recreational activities. Recreational significance should be based on quality, regardless of enjoyed for recreation by a relatively few or large number of participants.

Response: As noted in responses to previous comments, ADEQ believes that the level of recreational use, the types of recreational opportunities provided, and public access are all relevant factors to consider in making an exceptional recreational significance determination.

149. *Comment:* The draft rule lists a number of factors the Director may consider in deciding whether to propose or classify a nominated surface water as a unique water. We are concerned that the agency might consistently use Item #1: "Ability to manage the unique water" and Item #5: "Agency resource constraints" as regular excuses for not classifying a unique water. Agency resource constraints can almost always be used as an excuse to not implement envi-

ronmental protection and in this case to designate a surface water as a unique water. We strongly recommend that you further modify this to limit the use of this criterion, possibly to “only if the agency resource constraints make it impossible to manage this surface water and prevent degradation.” The Department does not put into its rules that it will only issue permits if resources are adequate. The agency should not use agency resource constraints as a reason not to protect surface waters that should be protected. The agency should instead request adequate resources for this program. If the director is going to consider factors like agency resource constraints, then the ADEQ should also consider the social, economic, and environmental impact of not designating a water body as a unique water. Inaction can be as costly if not more costly than action. We also think that the Department should be required to state explicitly why it has denied a request to list a water body as a unique water.

Response: ADEQ believes that an ability to manage a proposed unique water watershed for water quality and agency resource constraints are relevant factors that should be considered when ADEQ makes decisions on whether to classify a surface water as a unique water. The ability to manage a unique water has been one of the “primary designation criteria” for a unique water classification since the inception of the unique waters program [See Arizona Water Quality Council Unique Waters Policy, April 8, 1981, p. 2]. The consideration of agency resource constraints in the decision-making process is a pragmatic response to the increasing demand on ADEQ and the resources required to provide meaningful environmental protection through the unique waters program.

The primary benefit of a unique waters classification is Tier 3 antidegradation protection. Under Tier 3 antidegradation protection, existing water quality in a unique water must be maintained and protected. However, effective Tier 3 antidegradation protection can be provided only when ADEQ can determine baseline water quality and conduct enough water quality monitoring to determine whether existing water quality is being maintained and protected or whether water quality is degrading in a unique water. Surface water quality monitoring programs require time, staff resources, and money. While ADEQ has implemented a surface water quality monitoring program to assess water quality in the state’s unique waters each year, we are concerned about our ability to adequately monitor the increasing number of unique waters in the state. If the final rules become effective, the number of unique waters in the state will almost double. In an ideal world, ADEQ would be able to classify all of the surface waters in the state that deserve recognition as outstanding state resource waters and have the resources to implement an effective monitoring program that would assure meaningful Tier 3 antidegradation protection. In the real world of limited resources, ADEQ must consider whether it can classify additional surface waters as unique waters and still meet its responsibilities under the Clean Water Act.

147. *Comment:* The proposed rule says that the director may consider the social and economic impact of Tier 3 antidegradation protection. We believe the Director should be able to consider the social, economic, and ecological impact of not classifying the stream as a unique water. We do not think that the ADEQ should weigh agency opposition too heavily in making these decisions.

Response: ADEQ agrees. Ecosystem and preservation values may be considered by the Director as part of the evaluation of the social and economic impact of Tier 3 antidegradation protection.

148. *Comment:* ADEQ should incorporate by reference the Arizona Game and Fish Department list of “Species of Special Concern” and include it with the documents listed under R18-11-112(D)(4)(b).

Response: ADEQ disagrees. R18-11-112(D)(4)(b) addresses the classification of a surface water as a unique water on the ground that a threatened or endangered species is known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of the threatened or endangered species. “Endangered and threatened species” means federally-listed endangered and threatened species and does not include “species of special concern” identified by the Arizona Game and Fish Department.

149. *Comment:* “Riparian vegetation” appears under “exceptional recreational and ecological significance” with “flora” and “fauna” deleted. Why the deletion? Under the threatened and endangered species, it is understandable that species be associated with the surface water. However, it is not clear why under exceptional scenic significance the observation of an endangered non-riparian jaguar drinking from a stretch of a Arizona stream is not to be counted. Or the presence of non-endangered, non-riparian mountain lions rarely seen in the wilds. Or the observations of unusual, non-endangered, non-threatened, non-riparian plants? The lower Haunted Canyon nomination contains an unusually prolific and tall stand of Arizona cypress and ash, which owe their existence to the .7 mile perennial reach of the lower Haunted Canyon creek. If documented to be as stated, this non-riparian flora may not be counted under exceptional ecological significance? Does this not contradict the ADEQ proposal to model nomination criteria on Wild and Scenic River criteria which includes non-riparian geologic, wildlife, historic, cultural, or other similar values?

Response: ADEQ agrees that the more general terms, “flora” and “fauna,” that are found in the current unique waters rule should be retained. ADEQ did not change the examples of the types of attributes that can be used to demonstrate exceptional recreational or ecological significance in the final rule.

150. *Comment:* ADEQ indicated they were not considering listing several streams as unique waters because other agencies objected to it. We do not think that the ADEQ should deny a unique waters listing just because the Forest Service or BLM object to it. We fail to understand or see the justification for not adding the water bodies associated with the San Pedro, including Hot Springs Canyon, Bass Canyon, Redfield Canyon and Wildcat Canyon.

Response: ADEQ did not deny a request for unique water classification solely because a federal or state land management agency objected to it. ADEQ does consider such objections along with a number of other factors when making a decision whether to classify a surface water as a unique water [See R18-11-112(G) in the final rules. The rationale for ADEQ's decision not to classify Hot Springs Canyon, Bass Canyon, Redfield Canyon, and Wildcat Canyon is explained in the preamble on pp. 104-105.

151. *Comment:* ADEQ wants to consider completeness of a unique waters nomination in deciding whether to classify. The agency claims that it sometimes receives nominations without adequate information. While this is likely the case, the way to handle it is to ask for additional information, not to discount it or to make the process overly burdensome. If the ADEQ receives an incomplete application of an aquifer protection permit, the agency doesn't just dismiss it, the ADEQ instead asks the applicant for the missing information. Why should this be different?

Response: ADEQ agrees that the completeness of a unique waters nomination should not be a factor that should be considered when the agency is making a decision whether to classify a nominated surface water as a unique water. Rather, the completeness of a nomination is relevant at the initial stage of the nomination process when ADEQ is considering whether to include a nominated surface water as a proposed unique water in a Notice of Proposed Rulemaking. ADEQ agrees that the appropriate way to deal with incomplete nominations is to request additional information from the person making the nomination. ADEQ removed the completeness of a unique water nomination from the list of decision-making factors in R18-11-112(G) of the final rule.

R18-11-113. Effluent-dependent Waters

152. *Comment:* The Pima County Wastewater Management Department (PCWWM) proposes the addition of two additional stream reaches within the Santa Cruz basin as EDWs. The proposed reaches are currently classified as ephemeral waters. A permit application has been submitted for proposed discharges from the Green Valley WWTF to the Santa Cruz River (Tubac Bridge to Roger Road WWTF outfall) and for the Kino Wetlands Project that will discharge to Julian Wash. Documentation is attached as described in

R18-11-113(C) that provides a map and description of the surface water, information that demonstrates that the surface water consists of discharges of treated wastewater, and information that demonstrates that the receiving water is an ephemeral water.

Response: ADEQ did not add the EDWs to R18-11-113 as requested because the Governor's Regulatory Review Council advised ADEQ that the additions would be a substantial change to the rules that would violate A.R.S. § 41-1025.

153. *Comment:* There is a disparity in the number of streams ADEQ has designated to date as effluent dominated waters compared to the number that are unique waters. This observation gives the impression that ADEQ pays more attention to downgrading water quality than to preserving good quality streams. I am sure that is not the intent of ADEQ. I encourage the Director to strive for more of a balance here.

Response: ADEQ classified nine surface waters as unique waters in this triennial review. This nearly doubles the number of surface waters that have been classified as unique waters. If the final rules become effective, ADEQ will have recognized 19 unique waters. There are 36 effluent-dependent waters listed in the rules. While it is true that a difference in the number of unique waters and EDWs has developed over the last 20+ years of the existence of the two classifications, it is unfair to characterize the existence of a difference in the raw numbers as indicating an intent on ADEQ's that it pays more attention to degrading water quality than preserving it.

R18-11-114. Mixing Zones

154. *Comment:* We think it is inappropriate to delete the requirement that information demonstrate that there will be no acute toxicity in the proposed mixing zone. We support the change in the rule that prohibits mixing zones in ephemeral waters or where there is no water for dilution and in fact think the use of mixing zones in Arizona's waters should be very limited and might not be appropriate for all. We also support eliminating the use of mixing zones for bioaccumulative pollutants. We don't understand, however, why ADEQ is proposing to eliminate the public hearing and review of mixing zones.

Response: An absolute prohibition against acute toxicity in a mixing zone is inconsistent with current EPA guidance on mixing zones. Current EPA guidance states that a zone of initial dilution (ZID) may be established in a mixing zone where it is permissible to exceed an acute toxicity criterion provided certain conditions are met. In an appropriately-sized ZID immediately surrounding an outfall, neither acute or chronic toxicity criteria are met. However, the acute criterion must be met at the boundary of the ZID. In the outer mixing zone, the acute criterion, but not the chronic criterion must be met. A chronic criterion must be met at the boundary of the outer mixing zone. The amendment of the rule is consistent with current EPA guidance on mixing zones [See *Water Quality Standards Handbook, Second Edition*, Figure 5-1, p. 5-4, and *Technical Support Document for Water Quality-based Toxics Control*, § 2.2.2, p. 33]. EPA guidance does not completely prohibit mixing zones for acute toxicity criteria. Rather, EPA guidance prohibits concentrations of pollutants in a mixing zone that are acutely lethal to aquatic organisms passing through a mixing zone. The zone of initial dilution in the mixing zone must be sized to prevent lethality to passing organisms. Permit conditions limiting the size of a ZID would be based on hydraulic investigations and calculations provided to ADEQ that demonstrate that the acute toxicity criterion will be met at the boundary of the ZID during critical design flow conditions. Second, ADEQ did not eliminate public participation requirements for mixing zones. Under the final

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rule, the public participation procedures that apply to the review of draft NPDES permits apply to the review of mixing zones conditions. These public participation requirements ensure adequate public review of mixing zone requests.

155. *Comment:* AMA opposes the inclusion of cadmium in the list of persistent, bioaccumulative pollutants of concern for purposes of the proposed mixing zone ban. There is no explanation for this proposal in the preamble and AMA believes that cadmium should be removed from the list of banned pollutants for mixing zone purposes.

Response: ADEQ agrees that a rationale for the inclusion of cadmium in the list of pollutants for which mixing zones are banned was not provided in the Notice of Proposed Rulemaking. For this reason, ADEQ deleted cadmium from the list of persistent, bioaccumulative pollutants of concern in the final rule. ADEQ will consider additions to the list of pollutants for which mixing zones are banned, including toxic metals like cadmium, in future triennial reviews. Initially, the mixing zone ban includes pollutants that are of concern because they are both highly bioaccumulative and persistent in the environment.

156. *Comment:* In previous opinions that the Service has written, the indirect effects of a mixing zone rule included acute toxicity to several listed fish species. This lead the Service to conclude that mixing zones would likely adversely affect listed fish species. The proposed changes in the surface water quality standards would allow a certain zone of acute toxicity. Therefore, a direct effect of this proposed rule would be mortality. The potential direct and indirect effects of a mixing zone rule which allow acute and chronic toxicity within defined zones will adversely affect federally listed species. This is the inherent nature of a rule like the mixing zone rule, although its ultimate purpose is only to allow non-bioaccumulative pollutants to be discharged from a point source and subsequently diluted. The Service applauds ADEQ for including a list of pollutants for which mixing zones will not be allowed. A clarification that mercury in R18-11-114(k)(11) is methyl mercury, unless ADEQ's intention was to prohibit all forms of mercury from mixing zone permits. Selenium should also be included since it is a known bioaccumulative toxicant as well as a reproductive and development toxin to fish and wildlife.

Response: ADEQ does not agree that the establishment of a mixing zone, even those that may include a zone of initial dilution, necessarily leads to the conclusion that mixing zones will likely adversely affect listed federally listed species. Mixing zones must be evaluated on a case-by-case basis to determine whether the establishment of a mixing zone will adversely affect federally listed species. The final rule requires consideration of biologically sensitive areas in receiving surface waters, the predicted exposure of biota, and the likelihood that resident biota will be adversely affected. Requests for mixing zones that will likely adversely affect federally-listed species should be denied.

ADEQ appreciates the statement of support for the prohibition against mixing zones for persistent, bioaccumulative pollutants, including all forms of mercury. ADEQ did not include selenium in its initial list of pollutants for which mixing zones are banned because the initial list is based upon bioaccumulative pollutants of concern from the Great Lakes Water Quality Initiative. Selenium is not on the list of pollutants of initial focus in that initiative. ADEQ will consider proposed additions to the list, including metals such as selenium, in future triennial reviews.

157. *Comment:* The proposed rule indicates that if the ADEQ Director determines that a mixing zone should be established, "he shall establish a mixing zone as a condition of a NPDES permit." The proposed rule also states that "The Director may include mixing zone conditions in the NPDES permit that the Director deems necessary to protect human health and the designated uses of the surface water." Since NPDES permits are issued by EPA, the rule should describe a different mechanism by which the state makes determinations related to mixing zones.

Response: It is true that ADEQ currently does not have primacy over the NPDES permit program and EPA is the NPDES permit issuing authority in Arizona. However, the state is pursuing primacy and expects to obtain it in 2002. In the past, ADEQ has worked collaboratively with EPA on the establishment of mixing zones through the NPDES permit program. While ADEQ does not currently have authority to issue NPDES permits, ADEQ believes that the NPDES permit issuance process is the appropriate mechanism to make determinations on mixing zones for point source discharges.

158. *Comment:* We recommend that ADEQ not delete the requirement in the rule that a mixing zone applicant provide information showing that there will be no acute toxicity in the mixing zone and the requirement in the current rule that a mixing zone will be denied if concentration in the zone will cause acute toxicity to aquatic life. In our view, a mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. [See EPA Water Quality Standards Handbook, EPA 828-B-94-005A, at GLOSS-4. See also, EPA's Advance Notice of Proposed Rulemaking, Water Quality Standards Regulation, 63 Federal Register 36742, 36791, and 36,787 (July 7, 1998) ("EPA has consistently maintained that prevention of nuisance conditions, e.g., materials that will settle to form objectionable deposits, floating debris, oil, scum, foam, and other matter, toxic conditions, etc., through the application of narrative criteria apply to all waters, at all times, including mixing zones." and noting that states have been interpreting the federal mixing zone rule with an overly broad range of procedures.

Response: ADEQ disagrees. EPA's Technical Support Document for Water Quality-Based Toxics Control specifically discusses zones of initial dilution and areas where acute toxicity criteria may be exceeded in a mixing zone. While ADEQ agrees that such areas should be limited by appropriate permit conditions to prevent lethality, ADEQ does not believe they are categorically prohibited.

159. *Comment:* The proposed rulemaking would add factors that the Director is required to consider when determining whether to grant or deny a mixing zone in R18-11-114(D). We suggest that ADEQ consider including the follow-

ing additional factors: impact of the proposed mixing zone on other waste load allocations in the waterbody and impact upon threatened or endangered species.

Response: ADEQ believes that impacts on wasteload allocations, TMDLs, and threatened or endangered species are already included in the following factors that are currently listed in the final rule: 1) the “cumulative impact of other mixing zones and other discharges to a surface water” factor, 2) “biologically sensitive areas in a surface water,” and 3) predicted exposure to biota and the likelihood that resident biota will be adversely affected.” [See R18-11-114(D)]. No change to the rule.

160. *Comment:* ADEQ proposes to ban mixing zones for certain pollutants identified as persistent and bioaccumulative in R18-11-114(K). There is still a great deal of debate on the federal level as to what chemicals should be considered to be persistent and bioaccumulative, including, but not limited to, many metals. Asarco recommends that the introductory language be modified by deleting the phrase “persistent, bioaccumulative.”

Response: ADEQ disagrees. The initial list of pollutants for which mixing zones are banned is based on EPA’s list of pollutants identified as bioaccumulative chemicals of concern as defined in the Great Lakes Water Quality Initiative [GLWQI]. The GLWQI defined bioaccumulative chemicals of concern as chemicals that have the potential to cause adverse effects which upon entering a surface water, by itself or as a toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor greater than 1000, after considering metabolism and physico-chemical properties that might enhance or inhibit bioaccumulation. Chemicals with half-lives of less than eight weeks in the water column, sediment, and biota are not considered to be bioaccumulative chemicals of concern. In other words, the GLWQI banned mixing zones for pollutants that were both highly “bioaccumulative” and “persistent.” ADEQ believes that the “persistent, bioaccumulative” language in the rule helps to explain the underlying rationale for the mixing zone ban. No change to the rule.

R18-11-115. Nutrient Waivers

161. *Comment:* We support elimination of the nutrient waivers and believe that ADEQ should limit opportunities for noncompliance overall.

Response: ADEQ appreciates the statement of support for the repeal of the nutrient waiver provision. ADEQ believes that the nutrient waiver provision is unnecessary because of the existence of the variance procedure. In general, ADEQ agrees that exemptions, variances, waivers, and other mechanisms to avoid compliance with surface water quality standards should be limited.

R18-11-118. Dams and Flood Control Structures

162. *Comment:* The provision which removes the responsibility of operators of flood control structures from mitigating water quality impairments caused by third parties should remain.

Response: ADEQ disagrees. See response to the comment below.

163. *Comment:* The proposed rule would delete a rule providing that an owner or operator of a flood control structure is not required to mitigate water quality impacts caused by third parties. ADEQ believed that his deletion would be non-controversial since the provision was viewed as unnecessary. However, the provision is extremely important to the storm water system and others who are responsible for flood control structures. Water quality impairments may occur at flood control structures due to the acts of third parties, so the operators of such structures need the protection in the existing rule. The preamble to the proposed rule indicates that the only thing an owner of a flood control structure can do to improve water quality is to release water. That is not correct. Many flood control structures hold water for a period of time, such as retention basins. It is conceivable that someone could argue that the structure operator must treat the water before releasing it. There are numerous other examples where someone could argue that water released from flood control structures should be treated to remove pollutants discharged by someone other than the owner of the structure. The existing rule therefore should be retained.

Response: ADEQ disagrees and deleted R18-11-118(B) from the final rule. R18-11-118(B) states: “Nothing in this Article shall be construed to require a person who operates a dam or flood control structure to operate the structure to cure or mitigate an exceedance of a water quality standard caused by another person.” In recent years, this provision has been interpreted by the operators of flood control districts and municipal separate storm sewer systems (MS4s) as providing them with an exemption from having to comply with surface water quality standards or providing a release of liability for surface water quality standards violations on the novel legal theory that the violations are caused by third parties. This interpretation is not consistent with ADEQ’s original intent in adopting R18-11-118(B). ADEQ never intended to exempt or release flood control districts or the operators of MS4s from the legal obligation to comply with surface water quality standards and the requirements of the Clean Water Act. When R18-11-118(B) was originally adopted in 1992, ADEQ’s intention was to clarify that operators of dams and flood control structures were not required to operate a dam or a flood control structure to cure or mitigate a water quality standards violation in a downstream surface water. The original intent of R18-11-118(B) was to clarify that the operators of dams or flood control structures could not be forced to release water to dilute downstream pollution caused by someone else. In 1996, this original intent was more clearly stated in R18-11-118(C): “Nothing in this Article shall be construed to require the release of water from dams.”

It is not only “conceivable” that someone may argue that the operator of a MS4 is required to treat storm water discharges to surface waters, the argument has already been made in the Defenders of Wildlife litigation over Phase I storm water permits in Arizona. ADEQ specifically addresses this issue in its schedule of compliance rule at R18-11-121(C). R18-11-121(C) authorizes schedules of compliance in NPDES permits for point source discharges of storm water. The purpose of the rule is specifically authorize schedules of compliance for NPDES stormwater permits so they can be used to provide a reasonable amount of time for storm water discharges to come into compliance with applicable surface water quality standards. The fundamental premise of a schedule of compliance rule is that point source discharges of storm water must comply with applicable surface water quality standards. ADEQ is on record in R18-11-121(C) as endorsing a best management practices approach to controlling discharges of pollutants in storm water. However, ADEQ never exempted operators of MS4s from having to comply with surface water quality standards because violations may be caused by third parties. If R18-11-118(B) can be misinterpreted as providing such an exemption, then it should be repealed.

164. *Comment:* Does ADEQ have the statutory authority to promulgate this rule? [R18-11-118] If not, the current subsections B and C, and the proposed subsection B, should be deleted in the final rule.

Response: Yes. ADEQ has statutory authority to adopt the surface water quality standards rules in A.R.S. § 49-221 and A.R.S. § 49-222.

R18-11-119. Natural Background

165. *Comment:* The U.S. Fish & Wildlife Service has asked that when natural background in invoked by the state that EPA coordinate with other agencies and remediate abandoned mines as needed. EPA agrees that it is important to establish goals and targets for cleaning up abandoned mines. It is our position that this should be accomplished on a case-by-case basis. We advised the Service that we will continue or coordination with appropriate agencies relative to natural background conditions and when appropriate consider the influence of abandoned mines in such coordination. We also apprised the Service of ADEQ’s draft policy statement on making natural background determinations which is the state’s effort to provide a consistent approach to making such determinations. We also clarified that the state water quality standards rules make clear reference to natural background as being “not caused by human activity but is due solely to naturally-occurring conditions.” We request that the State provide a schedule for adoption of the policy statement on making natural background determinations.

Response: ADEQ adopted a natural background rule in R18-11-119. The current rule states that where the concentration of a pollutant exceeds a water quality standard and the exceedance is not caused by human activity but is due solely to naturally-occurring conditions, the exceedance will not be considered a violation of the water quality standard. ADEQ has issued a policy statement on making natural background determinations. ADEQ published criteria for making natural background determinations in the 1998 Water Quality Assessment (§ 305(b) Report). ADEQ stated on p. 24 of the 1998 § 305(b) Report that natural background determinations are based on the following criteria: 1) there is minimal anthropogenic disturbance within the affected water body and no probable anthropogenic source for the pollutant exists within the drainage area, 2) the pollutant is known to occur naturally in the form found at the site, 3) there is a probable natural source (for example, a spring or mineralized outcropping) located within or tributary to the affected water body or the violation satisfies the above criteria and is due wholly to natural processes associated with the drying of an ephemeral or intermittent water body (for example, low dissolved oxygen, high pH, concentration of naturally occurring toxicants). ADEQ believes that it has already made the requested policy statement on making natural background determinations. ADEQ requests either: 1) a confirmation from EPA that the published criteria satisfy EPA’s request for a policy statement or, 2) if ADEQ’s published criteria on natural background determinations are insufficient, a clarification from EPA of the minimum elements that must be included in a policy statement on natural background determinations that are acceptable to EPA.

R18-11-120. Enforcement

166. *Comment:* ADEQ proposes to amend R18-11-120(C) regarding compliance determinations with acute and chronic aquatic and wildlife criteria. ADEQ proposes to determine compliance with chronic criteria from the geometric mean of analytical results of the last 4 samples taken at least 24 hours apart. To be consistent with ADEQ’s proposed Impaired Water Identification rules, the samples should be collected more than 7 days apart. This would assure that the samples had temporal independence which is necessary to properly characterize the attainment status of a waterbody. We request that ADEQ use the more than 7-day criteria instead of the 24-hour criteria.

Response: ADEQ disagrees. The impaired water identification rule prescribes requirements for § 303(d) listing and the minimum requirements for data that is used for water quality assessment purposes. ADEQ may adopt different criteria for purposes of determining compliance with water quality standards. For example, ADEQ may determine that a chronic aquatic life criterion is violated on the basis of the results of four samples that are taken at least 24 hours apart and take enforcement action under R18-11-120. Under the proposed impaired water identification rules, ADEQ could not use that violation for water quality assessment or § 303(d) listing purposes because the samples do not meet the impaired water identification rule requirements for temporal independence. It is likely that the surface water samples collected by ADEQ staff as part of its routine surface water monitoring program will meet proposed requirements for temporal independence that are found in the new impaired waters identification rules. ADEQ surface water quality monitoring staff typically collect water quality samples on a quarterly basis. Thus, samples are normally collected more than seven days apart. However, it is possible that ADEQ compliance or TMDL staff may

conduct more intensive water quality investigations to follow up on possible water quality standards violations. For example, ADEQ staff may conduct a water quality investigation and collect samples over four consecutive days to determine if chronic aquatic life standards are being violated. ADEQ wrote R18-11-120 in a way that gives the agency the regulatory flexibility to make compliance determinations in both examples. ADEQ can adopt different minimum data requirements for compliance determinations, identification of impaired surface waters, and for making listing decisions. No change to R18-11-120.

167. *Comment:* While AMA supports the change from an arithmetic to a geometric mean in R18-11-120(C) for measuring compliance with chronic A&W criteria, AMA opposes the proposal to eliminate the language requiring compliance samples to be collected over a period of four consecutive days in lieu of language requiring the simple use of the last four samples taken at least 24 hours apart. Because chronic A&W criteria are established based on continuous exposure assumptions, samples taken at different times of the year will not be demonstrative of such continuous exposures and should not be used to determine compliance with the chronic criteria. ADEQ's rationale for changing the sampling protocol is to match its own sampling and monitoring schedule. Sampling to determine compliance with standards, with the resulting potential consequences of enforcement and other outcomes (such as potential impaired water listings) should not be dictated or defined by ADEQ's monitoring schedule, but rather should be consistent with the underlying exposure and other assumptions for the criteria in question.

Response: ADEQ disagrees that samples to determine compliance with chronic aquatic life criteria must be collected over four *consecutive* days. EPA guidance for deriving aquatic life criteria states that a numeric criterion consists of three components: 1) a magnitude or how much of a pollutant expressed as a concentration is allowable, 2) a duration or the period of time (averaging period) over which the in-stream concentration is averaged for comparison with criteria concentrations, and 3) a frequency or how often the criteria can be exceeded. EPA recommends a four-day averaging period for chronic criteria. However, EPA does not state that the averaging period must consist of four *consecutive* days or that compliance can be determined *only* from the results of samples collected over four consecutive days. ADEQ believes that it is scientifically defensible to determine compliance with chronic criteria from the geometric mean of sample results obtained over longer periods of time provided the sample results are averaged over at least 4 days. ADEQ recognizes that the quality of ambient surface waters is variable depending upon changes in the discharge of pollutants, stream flow, and other factors. Aquatic life do not experience constant, continuous exposures to pollutants in surface waters. Rather, organisms experience fluctuating exposures to pollutants over time. A geometric mean concentration calculated from at least four sample results takes such variability into account.

EPA's national criteria recommendations indicate a time period over which exposure is to be averaged, as well as an upper limit on the average concentration, to limit the duration of exposure to concentrations of pollutants. That is, the four-day average exposure should not exceed the chronic criterion. The way the final rule is written ensures that a four-day average exposure is obtained. Arguably, a four-day average exposure calculated from four separate sample events collected over the course of a monitoring year is probably more likely to indicate that there is a continuing chronic toxicity problem than the sample results obtained during four consecutive days in a monitoring year.

Finally, it should be noted that ADEQ uses a geometric mean value to compare to the chronic criteria. A geometric mean value is an expression of the central tendency of a data set. It is reasonable to determine compliance from the central tendency of a data set that includes the results of at least four samples taken over the course of a monitoring year.

168. *Comment:* The revision under consideration for R18-11-120(C) affects the number of samples required to determine compliance with chronic criteria. The revision would limit compliance determinations to a minimum of four samples. EPA believes that this approach would limit compliance determinations in situations where fewer than four samples were available and water quality exceedances are measured. EPA is particularly concerned that the proposed rule, if adopted, may be incorrectly interpreted to mean that a violation of a chronic A&W criteria cannot be found, even where available relevant and credible evidence clearly showed exceedances, unless at least four samples are analyzed. In addition, this provision does not define a time-frame within which the four samples should be taken.

Response: In ADEQ's view, a violation of chronic A&W criteria cannot be determined from less than four sample results. Compliance determinations with chronic criteria should be based on four-day average exposures. ADEQ does not believe that a time-frame or averaging period needs to be prescribed in the chronic A&W standards. ADEQ believes it is appropriate to determine compliance from a four-sample geometric mean calculated from the results of the last four samples taken.

169. *Comment:* EPA assumes that the proposed rule indicates how compliance will be determined with the subject criteria in the context of state law such as A.R.S. § 49-263, A.R.S. § 49-309, or A.R.S. § 49-772. We are concerned that the proposed rule may be misinterpreted as describing how compliance with the criteria will be determined in the Clean Water Act context. When administering the Clean Water Act, EPA would apply the criteria set forth in Appendix A, and may determine, for example, that an NPDES permit condition based on the criteria was violated in cases where less than four samples were taken. Further explanation of EPA's position regarding this issue may be found at EPA, Identification of Approved and Disapproved Elements of the Great Lakes Guidance Submissions from the States of Michigan, Ohio, Indiana, and Illinois, and Final Rule, 65 Fed. Reg. 47864 (August 4, 2000) ["EPA believes, as a matter of law, that any credible (subject to generally applicable rules of evidence), not just evidence generated by use of an analytical method specified in a permit, can be used in an enforcement action to establish that a violation of an effluent limitation has occurred."] See also, EPA, Notice of Final Rule, Credible Evidence Revisions, 62 Federal

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Register 8314 (Feb. 24, 1997) (In § 113 of the Clean Air Act, “Congress gave EPA clear statutory authority to use any available information – not just data from reference tests or other federally promulgated or approved compliance methods - to prove CAA violations.”). We request that the proposed rule be revised to clarify that the limitation on the method for determining compliance applies only in state enforcement actions. Alternatively, the state may choose not to adopt this language into rule. In addition, we request that ADEQ provide the statistical basis for this revision before the standards are adopted and submitted for EPA approval.

Response: First, R18-11-120(C) addresses how ADEQ, not EPA, determines compliance with acute and chronic aquatic and wildlife criteria. The final rule states in relevant part: “*The Department shall determine compliance with....*” The rule does not regulate how EPA establishes water quality-based discharge limitations in NPDES permits or how EPA enforces those permit conditions. Presumably, EPA’s establishment of permit conditions and their enforcement are addressed in the federal NPDES permit program regulations.

Second, ADEQ does not have a statistical basis for the revision of R18-11-120(C). The revision which states that compliance will be determined from a geometric mean of the sample results of the last four samples taken at least 24 hours apart is based on EPA guidance which recommends that the four-day average exposure not exceed the chronic criterion.

170. *Comment:* While AMA supports the change from an arithmetic to a geometric mean in R18-11-120(C) for measuring compliance with chronic A&W criteria, AMA opposes the proposal to eliminate the language requiring compliance samples to be collected over a period of four consecutive days in lieu of language requiring the simple use of the last four samples taken at least 24 hours apart. Because chronic A&W criteria are established based on continuous exposure assumptions, samples taken at different times of the year will not be demonstrative of such continuous exposures and should not be used to determine compliance with the chronic criteria. ADEQ’s rationale for changing the sampling protocol is to match its own sampling and monitoring schedule. Sampling to determine compliance with standards, with the resulting potential consequences of enforcement and other outcomes (such as potential impaired water listings) should not be dictated or defined by ADEQ’s monitoring schedule, but rather should be consistent with the underlying exposure and other assumptions for the criteria in question.

Response: ADEQ disagrees that samples to determine compliance with chronic aquatic life criteria must be collected over four consecutive days. EPA *Guidelines for Deriving National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* state that aquatic organisms should not be adversely affected if the four-day average exposure to a pollutant does not exceed a chronic criterion more than once every three years on average. While EPA recommends an averaging period of four days for chronic criteria, an averaging period of four *consecutive* days is not a required element of a chronic criterion. ADEQ interprets the EPA guidelines to provide more flexibility. Nowhere does EPA guidance say that compliance can be determined *only* from the results of samples collected over four consecutive days. ADEQ believes that it is scientifically defensible to determine compliance with chronic criteria from the geometric mean of sample results obtained over longer periods of time provided the sample results are averaged over at least four days. ADEQ recognizes that the quality of ambient surface waters is variable, depending upon changes in the discharge of pollutants, stream flow, and other factors. Aquatic life do not experience constant, steady exposures to pollutants in surface waters. Rather, they experience fluctuating exposures. EPA’s national criteria recommendations indicate a time period over which exposure is to be averaged, as well as an upper limit on the average concentration, to limit the duration of exposure to concentrations of pollutants. For chronic criteria, the averaging period is four days. ADEQ’s revision of R18-11-120(C) includes a four-day averaging period. However, it does not require that the four samples be taken on four consecutive days.

171. *Comment:* ADEQ proposes to modify R18-11-120(C) to assess compliance with chronic criteria based on an average of four samples taken at least 24 hours apart, rather than four samples taken over four consecutive days. This could result in compliance being based on an average of samples being taken weeks, months, or even years apart. The problem with this approach is that chronic criteria are established based on an assumption of continuous exposure over four days. Thus, the requirement that samples be taken on four consecutive days is necessary to accurately assess compliance with the criteria. Measurements that are weeks, months, or years apart will not necessarily tell you if such continuous exposure is occurring, and thus if the criterion is being exceeded. It is possible that levels of the parameter in the water will vary, and that elevated levels that are far apart in time will not reflect continuous concentrations (and thus will not reflect exceedances of the chronic criterion). Because R18-11-120 is an enforcement provision, this is a significant issue. Asarco recommends not modifying this portion of R18-11-120(C).

Response: ADEQ disagrees that samples must be taken over four consecutive days. See response to previous comment.

R18-11-121. Schedules of Compliance

172. *Comment:* AMA supports the proposed changes to R18-11-121(A) which clarify the application of compliance schedules to new point sources consistent with the applicable federal regulations at 40 CFR § 122.47(a)(2). In addition, while AMA does not necessarily oppose the proposed compliance schedule language in R18-11-121(D) addressing storm water discharge, AMA reemphasizes the need for ADEQ to initiate a review, with stakeholder input, regarding the actual application of the current water quality standards to storm water discharges as well as to ephemeral waters in general.

Response: ADEQ appreciates the statement of support for the proposal to authorize schedules of compliance for new and recommencing dischargers. ADEQ agrees with the commenter that the larger issue of wet weather standards, the applicability of surface water quality standards to storm water discharges, and the development of appropriate water quality standards for ephemeral waters needs further review and discussion. However, these complex issues are beyond the scope of this triennial review.

173. *Comment:* Asarco supports the limited recognition of schedules of compliance for new and recommencing point sources. The narrow scope of this provision (available only based on changes to water quality standards) provides adequate guarantees that it will not be abused.

Response: ADEQ agrees. The final rule authorizes schedules of compliance for new and recommencing point sources under a limited set of conditions.

R18-11-122. Variances

174. *Comment:* In addition to eliminating the nutrient waivers, the section allowing the Director to grant variances for water quality should be more limited. What if not taking action to protect water quality would result in substantial and widespread economic and social impact? Shouldn't that be a consideration in deciding whether or not to grant a variance? This should only be allowed if all reasonably available measures have been ruled out. We agree that they should be discharger-specific only. Who decides when something is not economically feasible? It appears that there are a lot of dischargers that would like to use this as an excuse. We oppose expanding the variance rule to include nonpoint source discharges and support ADEQ's decision not to do so. It is already a challenge to regulate nonpoint source discharges and to ensure compliance with best management practices; allowing variances would make it impossible. We also concur with ADEQ's decision to limit the variance to specific dischargers and to specific pollutants rather than apply them to specific surface waters. We agree that a temporary variance is preferable to a downgrade of the water quality standards, but continue to believe that variances should be very limited in their availability.

Response: ADEQ disagrees that the variance provision should be more limited than it is. The variance provision at R18-122 is already limited in scope. Under the state rule, variances must be point source discharger-specific and they are pollutant-specific. Variances are not available for nonpoint source discharges under the rule. Variances are for limited terms of five years. While the rule authorizes renewals of variances, dischargers must demonstrate that reasonable progress is being made towards achieving compliance with applicable water quality standards. The grounds for obtaining a variance in Arizona are more limited than the grounds for variances that are acceptable to EPA. Moreover, Arizona's variance rule provides for public participation in the decision-making process and gives persons who are adversely affected by the grant of a variance the right of appeal to an administrative law judge. ADEQ believes that these substantive and procedural rules appropriately limit variances. No change to the rule.

175. *Comment:* The Arizona Mining Association agrees with ADEQ's proposal to include an additional ground for a variance when human caused conditions or sources of pollution prevent attainment of the water quality standards and cannot be remedied within the next five years. The further expansion of the existing variance provision is necessary to give ADEQ and the regulated community the necessary flexibility to address water quality issues, while recognizing that the ultimate decision to grant or deny a specific variance request remains with the ADEQ Director. In fact, AMA continues to believe, consistent with its prior comments on earlier rule drafts, that a variance provision should be as flexible as possible and should apply to entire water segments and nonpoint sources.

At the very least, AMA requests that ADEQ expand its variance procedure to include all six factors identified by EPA in 40 CFR § 131.10(g). The inclusion of these factors in state variance regulations is directly supported by EPA regulations and guidance and would ensure that Arizona's variance provision is at least as flexible as what is clearly authorized under EPA water quality regulations and guidance. There is no reason why ADEQ should not include all six of the factors in 40 CFR § 131.10(g) in the existing variance provisions. ADEQ can then determine (subject to its discretion) on an individual case basis whether a variance is warranted by one or more of the factors and whether the factors are suited to granting a variance for a point source discharger in the specific situation presented.

Response: ADEQ disagrees that variances should be permitted for all of the grounds that support a use attainability analysis. While EPA guidance on variances indicates that a variance from a water quality standard may be based upon any of the 6 grounds for removing a designated use prescribed in 40 CFR § 131.10(g), ADEQ does not believe that at least four of the grounds cited in 40 CFR § 131.10(g) are appropriate for a discharger-specific variance. These four grounds are:

1. Naturally occurring pollutant concentrations prevent the attainment of the water quality standard;
2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the water quality standard, unless these conditions may be compensated by the discharge of a sufficient volume of effluent to enable the water quality standard to be met without violating state water conservation requirements;
3. Dams, diversions or other types of hydrologic modifications preclude the attainment of the water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the water quality standard; and
4. Physical conditions related to the natural features of the waterbody such as the lack of a proper substrate, cover, flow, depth, pools, riffles and the like, unrelated to chemical water quality, preclude the attainment of the water quality standard.

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While the four grounds cited above may support the removal or downgrade of a designated use of a surface water, they do not support a variance for a specific point source discharger. For example, it is not clear how “naturally occurring pollutant concentrations which prevent attainment of the water quality standard” may be applied to support a variance for an individual point source discharger. While there may be situations where it is not possible to comply with a water quality standard because of naturally occurring pollutant concentrations in a surface water, it is difficult to see why a point source discharger should be granted a temporary variance from a water quality standard on this ground. If it is impossible to attain compliance with a water quality standard because of naturally occurring pollutant concentrations, then the appropriate response is to conduct a use attainability analysis to modify the water quality standard for the surface water. Variances are premised on the belief that the conditions which prevent the attainment of a water quality standard are temporary in nature and that compliance with the water quality standard ultimately can be achieved. When a naturally occurring concentration of a pollutant prevents attainment of a water quality standard, it is unlikely that compliance with the water quality standard can be achieved. Naturally-occurring pollutant concentrations in a surface water are permanent in nature. Similarly, when natural, ephemeral, intermittent or low flow conditions prevent attainment of standards; or dams, diversion, or other types of hydrologic modifications prevent attainment; or physical conditions related to the natural features of a surface water prevent the attainment of a water quality standard, then the appropriate regulatory response is a UAA, not a variance. When such conditions exist, they are permanent in nature and it is unlikely that such conditions will change in the future.

When ADEQ adopted the variance provision in 1996, ADEQ stated its position that only one element in 40 CFR § 131.10(g) may be applied on a discharger-specific basis because only one ground was related to a discharger’s capability to install and operate discharge control technology to attain designated uses. 40 CFR § 131.10(g)(6) allows the removal of a designated use if it can be demonstrated that attaining the designated use is not feasible because “controls more stringent than those required by § 301(b) and § 306 of the Act would result in substantial and widespread economic and social impact.”

When EPA first indicated the allowability of state water quality variance provisions in the federal Water Quality Standards Regulations at 40 CFR § 131.13, EPA stated in the preamble that state-adopted variances could be approved if they were based upon a demonstration that meeting a water quality standard would cause “substantial and widespread economic and social impact” [See 48 Federal Register 51403]. This conclusion was based upon Decision of the General Counsel No. 58 [44 FR 39508 (March 29, 1977)]. In that decision, EPA stated:

[V]ariances can be granted by States only when achieving the standard is unattainable. In demonstrating that meeting the standard is unattainable, the State must demonstrate that treatment in excess of that required by § 301(b)(2)(A) and (B) of the CWA is necessary to meet the standard and also must demonstrate that requiring such treatment will result in substantial and widespread economic and social impact....

Subsequent EPA guidance has elaborated federal variance policy. On March 15, 1985, EPA issued a memorandum reinterpreting the factors that could be considered when granting variances. The EPA memorandum explained that variances could be based on any of the grounds outlined in 40 CFR § 131.10(g) for removing a designated use. This interpretation was based on EPA’s reading of § 410 of the Clean Water Act which provides that states have the right to establish more stringent standards than those suggested by EPA. EPA concluded that as long as a temporary water quality standards variance conformed to the requirements established in 40 CR § 131.10(g) for the removal of a designated use, it would be more stringent than the federal requirements since it would be a temporary rather than a permanent downgrade in the use.

EPA has stated in guidance that although the March 15, 1985 memorandum broadened the factors that could be considered for granting a variance, *it continued to interpret variances as being limited to individual dischargers*. EPA acknowledged that while the legal rationale for broadening the factors may seem reasonable, the practical impact of limiting variances to individual dischargers is that the only factor that can be actually used is the “substantial and widespread economic and social impact” factor.

The variance provision at R18-11-122 is intended to apply on a discharger-specific basis. ADEQ recognizes that situations can and do arise where technological limitations or substantial economic hardship for a specific discharger make short-term compliance with standards impossible. In such cases, a variance from the water quality standard may be justified. In ADEQ’s view in 1996, the only ground that could be practically applied to support a request for a variance in such situations was the “widespread and substantial economic and social impact” factor.

In comments on preliminary draft and the proposed surface water quality standards rules, the Arizona Mining Association renewed a request to expand the grounds for variances and to allow variances for specific surface waters or segments of surface waters. ADEQ continues to disagree that variances should be allowed for specific surface waters. Variances should be allowed on a discharger-specific basis only. This is consistent with current EPA policy that variances are discharger and pollutant-specific and limited in duration. A “waterbody variance” is essentially a modification of a water quality standard that can only be done in Arizona through the rulemaking process.

The suggestion by the Arizona Mining Association to allow for “waterbody variance” is consistent with an approach to variances that EPA is solicited comment on in the Advanced Notice of Proposed Rulemaking (ANPR) on the water quality standards regulation. EPA stated in the ANPR that it was considering the approach of dividing variances into two categories: waterbody variances [to which the first five designated use removal elements in 40 CFR § 131.10(g) would apply] and discharger-specific variances [to which the “substantial and widespread economic and social

impact” factor would apply]. While ADEQ recognition of a “waterbody variance” would be consistent with EPA’s approach, ADEQ does not believe that the grounds which support a “waterbody variance” are distinguishable from the factors that support the downgrade or removal of a designated use through the use attainability process. For example, if naturally occurring pollutant concentrations in a surface water prevent the attainment of a designated use, then the appropriate regulatory response is the removal of the designated use, not the issuance of a variance that is limited in duration. In general, variances should be used only where the state believes that a water quality standard can ultimately be attained. ADEQ believes that four of the five grounds in 40 CFR § 131.10(g) [other than “widespread and substantial economic and social impact” and “human-caused sources of pollution”] that are cited by EPA as supporting a “waterbody variance” are essentially permanent in character. It is unlikely that where such conditions exist in a surface water, that the conditions will change so that the water quality standard ultimately may be attained. Where a water quality standard cannot be attained because of naturally occurring pollutant concentrations; low flow conditions; the existence of dams, diversions or other hydrological modifications; or physical conditions related to the natural features of a surface water, it is unlikely that the water quality standard will ever be attained, even in the long term. Where such conditions exist, a UAA should be conducted to remove or permanently downgrade the designated use. Finally, it should be noted that while EPA stated that it was considering water body variances in the ANPR, EPA has not proposed this type of variance in any revisions to the federal water quality regulations.

ADEQ reconsidered one of the grounds for a UAA that ADEQ believes may be used to support a variance. One of the grounds for a UAA is “...human-caused conditions or sources of pollution prevent the attainment of the water quality standard and cannot be remedied, or would cause more environmental damage to correct than leave in place.” There may be situations where human-caused conditions or sources of pollution prevent the attainment of a water quality standard and they cannot be remedied in the short-term (that is, within 5 years), but the water quality standard may be ultimately attainable. For example, a TMDL strategy may be implemented that is designed to achieve compliance with a water quality standard or implementation of a remediation program may result in attainment. However, the time line for achieving compliance with the water quality standard may be more than five years out. Under such circumstances, it may be appropriate to grant a variance to a point source discharger.

176. *Comment:* Variances to NPDES permits are inherently going to cause adverse effects to endangered and threatened species. The Service agrees with upholding the right to grant variances based only on discharge-specific cases, rather than on nonpoint source scenarios or waterbody-specific scenarios. The Service also agrees with ADEQ’s philosophy that variances should be viewed as temporary in nature with the hopes that the current water quality standard will one day be achievable, although it is clear in the proposed language that variances could be granted for longer than five years.

Response: ADEQ disagrees that variances to water quality standards that are granted on a discharger-specific basis will “inherently cause adverse effects to endangered and threatened species.” Individual requests for variances must be evaluated on a case-by-case basis to determine whether there is likely to be an adverse effect on a threatened or endangered species. Also, the state variance rule states at

R18-11-122(K) that a variance is subject to review and approval by the Regional Administrator of the U.S. Environmental Protection Agency. EPA review and approval of variances is a federal action that would be subject to § 7 consultation under the Endangered Species Act.

177. *Comment:* Asarco supports the proposed changes to the variance provision. The change brings Arizona law on this point into closer conformance with federal law on this point. In fact, additional changes also may be appropriate, as outlined in the Arizona Mining Association comments.

Response: ADEQ appreciates the statement of support for the amendments to the variance provision. ADEQ disagrees with the revisions to the variance rule suggested by the Arizona Mining Association. See response to previous comment.

R18-11-123. Prohibition Against Discharge

178. *Comment:* The Sierra Club supports the prohibition of the discharge of human body wastes into Lake Powell.

Response: The prohibition against the discharge of sewage from vessels to Lake Powell is based upon § 312(f)(1)(B)(3) of the Clean Water Act which addresses the regulation of marine sanitation devices. It states, in relevant part:

[I]f any State determines that the protection and enhancement of the quality of some or all of the waters within such State require greater environmental protection, such State may completely prohibit the discharge from all vessels of any sewage, whether treated or not, into such waters, except that no such prohibition shall apply until the Administrator determines that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such water to which such prohibition would apply.

The States of Utah and Arizona applied to EPA to prohibit the discharge of sewage to Lake Powell. Arizona determined that the protection and enhancement of Lake Powell water quality requires greater environmental protection by prohibiting discharges of sewage from vessels. Moreover, Arizona believes that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available at Lake Powell. For this reason, ADEQ included the prohibition against the discharge of sewage from vessels to Lake Powell in R18-11-123.

Appendix A. Numeric Water Quality Criteria

179. *Comment:* We are concerned that ADEQ is proposing to weaken the numeric standards relative to partial-body contact and full-body contact. We believe that is inappropriate. ADEQ should default to more protective standards if there is doubt and the agency should ensure an adequate margin of error that protects the most vulnerable in our population - young children. We are not convinced these proposed standards will do that.

Response: The current method for calculating water quality criteria for the partial-body contact designated use employs consumption and exposure values that are as restrictive or more restrictive than those used to calculate the full-body contact standards. This creates a situation where the standard meant to protect for episodic, accidental ingestion is more protective than that calculated to protect the long term, daily ingestion of water while swimming.

When the original methodology for calculating partial-body contact standards was designed, very little data on this subject were available and several overly conservative assumptions were made. This caused the calculated partial-body contact standard to be ten times more protective than that calculated for the full-body contact standard in many instances. For example, a water consumption rate ten times greater than that assumed for full-body contact and a lifetime, daily exposure rate were factored into the formula for calculating partial-body contact criteria. Because partial-body contact was assumed to be a less stringent contact scenario, if the calculated full-body contact standard was less stringent than the partial-body contact standard, the partial-body contact standard was applied to both uses. This led to a full-body contact standard ten times more stringent than actually calculated. We believe this is scientifically indefensible.

ADEQ proposes to employ the method used for calculating the full-body contact standard for both the full-body contact and the partial-body contact designated uses with the difference that carcinogenic endpoints will not be considered for the partial-body contact designated use due to the infrequent, episodic exposure scenario. We believe this will provide adequate protection for both designated uses.

180. *Comment:* We do support the revisions to the numeric ammonia criteria for aquatic life protection that include the adoption of chronic values recommended by EPA. Adoption of these criteria should help provide better protection for wildlife in our lakes and streams and also could result in improvements to wastewater treatment facilities. Ammonia has clearly demonstrated toxic impacts on wildlife and even relatively low concentrations of ammonia can severely stress fish, making them vulnerable to diseases. Of course, high concentrations of ammonia are lethal to fish.

Response: ADEQ agrees. The current water quality standards to prevent ammonia toxicity only address acute toxicity. The adoption of ammonia criteria to prevent chronic toxicity will provide significantly better protection for aquatic life. The criteria address both the pH and temperature-dependence of ammonia toxicity. The final ammonia criteria are taken from EPA's 1999 Update of the Ambient Water Quality Criteria for Ammonia.

181. *Comment:* To adequately protect human health in this state, ADEQ should work with the Arizona Department of Health Services and other agencies to obtain better data on fish consumption.

Response: ADEQ agrees. Reliable state data on fish consumption rates would be very helpful in developing criteria for the fish consumption designated use that are more tailored to protect the health of Arizona's population. EPA recommends that states use results from fish intake surveys conducted in the state to estimate fish intake rates that are likely to represent the defined populations being addressed. Generally, the more specific the data are to persons who harvest and consume fish from the state's surface waters, the better the data are considered to be for estimating accurate fish intake rates. However, information on fish consumption habits in Arizona is not readily available and the state would have to conduct its own survey. EPA has developed a guidance manual entitled *Guidance for Conducting Fish and Wildlife Consumption Surveys* which would be helpful in planning and conducting a survey in Arizona. Unfortunately, the state does not have the resources available to conduct a survey of consumption rates that would provide the information necessary for making valid statistical analyses of risks to subsistence and recreational anglers. ADEQ does not have funding nor the in-house expertise to conduct a statistically valid fish consumption survey. Until such time as resources become available to obtain data to derive more refined fish consumption criteria for Arizona, ADEQ will continue to rely on the default fish consumption rate of 6.5 grams / day.

182. *Comment:* We encourage ADEQ to adopt revisions in its methodology for deriving the water quality criteria for the fish consumption designated use and to use bioaccumulation factors (BAFs) rather than bioconcentration factors (BCFs). The BAFs are more protective of human health because they include all sources from which an organism can uptake a waterborne pollutant including the sediment, food, etc. The BCF only looks at uptake through the water itself.

Response: In recent guidance on the derivation of ambient water quality criteria to protect human health, EPA has recommended the use of bioaccumulation factors to reflect the uptake of a contaminant by fish from all sources rather than just from the water column that is reflected by the use of a bioconcentration factor. Due to the large amount of variability inherent in Arizona's natural and anthropogenically affected aquatic food webs and ecosystems and the complex relationship between individual toxicants, bioavailability, water chemistry, tissue lipid concentration and the existing data gaps, it is not possible for ADEQ to use the BAF methodology to calculate water quality standards. Surface water quality criteria for the fish consumption designated use are calculated using empirically-derived bioconcentration factors. The state also implements the narrative toxics standard found at R18-11-108 A.(5) through a fish

advisory program. In this program, the bioconcentration / bioaccumulation of toxicants is directly measured in edible fish tissue taken from specific surface waters.

183. *Comment:* Because many of these criteria are established and based on the average weight of a human male, they fail to address the impacts on children and in some instances women. For example, there is increasing evidence connecting numerous pesticides and other chemicals that affect estrogen production to breast cancer in women. We think ADEQ should use the precautionary principle wherever possible and use the most protective standard available.

Response: When deriving water quality standards, many uncertainty / safety factors are built into the calculation. First, the calculation of the reference dose (RfD) or cancer oral slope factor (OSF) incorporates uncertainty factors to address factors such as inter-individual variability, extrapolations from non-human data, nutritional and environmental confounders, and data gaps that could potentially affect the estimation of the toxicity or carcinogenicity of a pollutant to humans. These uncertainty / safety factors often constitute the portion of the calculation that has the largest effect on the final product. Also, if health effects in children are of predominant concern, the RfD is calculated using that data. Second, the average weight used in the calculation of the surface water quality standards (70 kilograms) is the average weight for *both* male and female adults. Third, the consumption rate assumptions used in standards calculations for both water and fish are for adults. The EPA default consumption rate for water for children is 1 liter per day. Given this, the calculation for DWS using the EPA default adult water consumption rate of 2 liters per day is equal to that which would be calculated for a 35 kilogram child consuming 1 liter per day.

184. *Comment:* Pima County operates an ADHS certified analytical laboratory. This laboratory contains state-of-the-art GCMS instruments to analyze for volatiles and semivolatile compounds. The laboratory can achieve the following practical quantitation limits (PQLs) and method detection limits (MDLs) for the following compounds:

Benzo(a)pyrene	PQL / MDL 1.0 / 0.33 µg / L
Bis (2-chloroethyl) ether	PQL / MDL 5.0 / 1.28 µg / L
1,2-Dibromomethane (EDB)	PQL / MDL 0.5 / 0.12 µg / L
N-nitrosodimethylamine	PQL / MDL 1.0 / 0.93 µg / L

For any laboratory to routinely achieve detection limits below those shown for the four compounds listed above would be difficult at best and not realistic. The Ina Road laboratory reports “trace” for values between the PQL and MDL. For these reasons, we request that ADEQ set the numeric water quality criteria for each of the four compounds above, for the PBC designated use, at the PQL for each analytical method.

Response: Water quality criteria are established at concentrations to protect designated uses. They are derived without consideration of the abilities of analytical laboratories to achieve specific method detection limits or to practically quantify concentrations of pollutants. Water quality criteria are not based on how laboratories perform, even state-of-the-art laboratories. Water quality criteria are established at levels that are deemed necessary to protect the designated use. Criteria established at practical quantitation levels may not adequately protect designated uses.

185. *Comment:* AMA strongly supports ADEQ’s well-reasoned decision to maintain the fish consumption rate of 6.5 grams / day for purposes of calculating the water quality criteria for the fish consumption designated use.

Response: The use of a 6.5 grams / day as a default fish consumption rate is reasonable in the absence of reliable data on consumption rates of anglers and subsistence fishermen in Arizona and uncertainty regarding the applicability of national fish consumption rates to the Southwest.

186. *Comment:* ADEQ is proposing to adopt FBC and PBC standards for total chromium of 100 µg / L whereas the standards for Cr III (2,100,000 µg / L) and Cr VI (4,200 µg / L) are much higher. The Arizona Mining Association questions the validity of the 100 µg / L standard for total Cr and requests that ADEQ analyze its proposed adoption of FBC and PBC standards for total Cr.

Response: ADEQ adopted FBC and PBC standards for total chromium based on the availability of the primary drinking water maximum contaminant level (MCL) for total chromium. ADEQ calculated FBC and PBC criteria using different methodologies which rely upon cancer potency slopes (q1*s), reference doses (RfDs) and Minimum Risk Levels (MRLs). For pollutants for which there is no q1*, RfD, or MRL but there is an MCL or an action level [e.g. lead and copper], ADEQ used the MCL or action level to protect the full-body contact and partial-body contact designated uses. This situation occurred for total chromium.

187. *Comment:* The City believes that the fish consumption standards for bromodichloromethane and dibromochloromethane are incorrect because they differ substantially from the EPA national criteria for these substances (as listed on EPA’s Water Quality Criteria and Standards website). ADEQ’s proposed standards are 11.6 µg / L for bromodichloromethane and 8.55 µg / L for dibromochloromethane while EPA’s numeric criteria are 46 and 34 µg / L respectively. It appears from the preamble to the surface water quality standards rules that ADEQ, in calculating numeric standards, intended to use the same exposure assumptions, q1*s or RfDs, and bioconcentration factors as EPA. We believe that ADEQ may have made an error in calculating these standards perhaps by using an incorrect bioconcentration factor. EPA references the 1980 Ambient Water Quality Criteria Document as the source of their bioconcentration factors. The City recommends that ADEQ adopt the EPA numeric criteria for these parameters.

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Response: ADEQ agrees that fish consumption criteria for bromodichloromethane and dibromochloromethane in the proposed rule were incorrect. ADEQ adopted fish consumption criteria for these pollutants that are consistent with EPA criteria recommendations.

188. *Comment:* The rule is somewhat confusing in regard to how the numeric standards are applied for the individual trihalomethane parameters. We recommend eliminating the numeric limits from the individual parameters and insert a footnote. The footnote would explain that the parameter is a trihalomethane and give the conditions under which the total trihalomethane standard is exceeded. For example, "Bromoform, chloroform, chlorodibromomethane, and dichlorobromomethane are trihalomethanes regulated by the total trihalomethane numeric standard. The total trihalomethane standard is exceeded when the sum of these four compounds exceeds 100 µg / L."

Response: ADEQ agrees and made the change to the footnote as suggested by the commenter.

189. *Comment:* AMA strongly supports ADEQ's proposal to delete the chronic criteria to protect the A&W(ephemeral) designated use. Ephemeral waters flow only in direct response to precipitation events and therefore application of chronic criteria to such waters is inappropriate and unnecessary.

Response: ADEQ agrees. Water quality criteria to protect aquatic life contain two expressions of allowable magnitude. Acute criteria are established to protect against short-term effects and chronic criteria are established to protect against long-term effects of pollutants. In general, EPA derives chronic criteria from longer term toxicity tests (often greater than 28-days) that measure survival, growth, and reproduction of test organisms. The term of these toxicity tests is often greater than the length of time that ephemeral waters typically flow in Arizona.

The surface water quality standard rules currently include an aquatic and wildlife designated use that applies to ephemeral waters (A&We). The A&We designated use has both acute and chronic criteria to protect aquatic life and wildlife. However, ADEQ has determined that chronic A&We criteria are unnecessary to protect the designated use. ADEQ defines an ephemeral water as a surface water that flows only in direct response to precipitation and that is at all times above the water table. Surface waters that flow continuously for 30 days or more are considered to be intermittent waters that are protected by A&Wc or A&Ww designated uses. The A&Wc and A&Ww designated uses have both acute and chronic criteria. ADEQ has determined that chronic criteria are unnecessary for ephemeral waters because they flow for less than 30 days at a time and the duration of exposure of organisms to pollutants is short-term. ADEQ therefore repealed the current chronic criteria for the A&We designated use.

190. *Comment:* The City is curious about the development of fish consumption standards for parameters for which EPA has not established criteria. ADEQ has added or revised the FC standards for beryllium, cadmium, chromium III, chromium VI, dibutyl phthalate, 2,6-dinitrotoluene, di-n-octyl phthalate, naphthalene, and silver. According to the EPA publication, *National Recommended Water Quality Criteria-Correction* (April, 1999), EPA has not established fish consumption criteria for these parameters. The City recommends removing these standards unless ADEQ has justification for retaining them.

Response: ADEQ has a statutory mandate to adopt numeric standards for each of the priority pollutants

[See A.R.S. § 49-222 (B)]. In response to this mandate, ADEQ established water quality criteria for pollutants for which EPA has not established national criteria recommendations pursuant to § 304(a) of the Clean Water Act. The preamble to the final rule describes the methodologies ADEQ used to derive fish consumption criteria for carcinogens and non-carcinogens. The criteria derivation methodologies require data on cancer potency slopes, reference doses, and bioconcentration factors. Where ADEQ had enough data to derive a numeric criterion for a priority pollutant, ADEQ did so.

191. *Comment:* The City requests that ADEQ include in the public record all the data used to calculate the numeric standards and the sources of those data. This would allow anyone to verify ADEQ's numeric standards.

Response: ADEQ agrees that the data used to calculate numeric criteria (e.g., q1*s, RfDs, BCFs, etc.) should be a part of the administrative record and available to the public so interested persons can verify the numeric water quality standards. A spreadsheet that contains all of the relevant data used by ADEQ to derive the numeric criteria is available upon request.

192. *Comment:* The City disagrees with the adoption of non-MCL criteria to protect the Domestic Water Source designated use. Under the Safe Drinking Water Act, EPA has already established a methodology for the development of drinking water criteria to protect human health. It is not necessary for ADEQ to protect the source water to a higher level than is necessary in finished water.

Response: ADEQ disagrees in part. ADEQ agrees that it is appropriate to use Safe Drinking Water Maximum Contaminant Levels (MCLs) to protect the domestic water source designated use when MCLs are available. ADEQ disagrees that the state can only adopt DWS criteria for pollutants that have MCLs. ADEQ is not precluded from developing DWS standards for other pollutants for which there are no MCLs. State law mandates that ADEQ establish water quality standards for each of the 126 priority pollutants. In response to this mandate, ADEQ has established numeric water quality criteria to maintain and protect water quality for the DWS designated use for priority pollutants that do not have MCLs. Using the methodologies described in this preamble for deriving criteria for the DWS designated use, ADEQ calculated criteria for priority pollutants where sufficient data to derive a criterion were available.

193. *Comment:* The City is concerned that the 700 µg / L standard for total residual chlorine conflicts with EPA's proposed MRDL (Maximum Residual Disinfectant Level) of 4.0 mg / L for chlorine effective January 1, 2002. Chlorine is recognized as an effective and acceptable disinfectant for water supplies. Therefore, it seems inappropriate to establish a DWS standard that is almost 6 times more stringent than the concentration EPA deems allowable in the drinking water itself. This may send a message to the public that their drinking water is unsafe.

Response: ADEQ adopted a DWS criterion for total residual chlorine of 700 µg / L for total residual chlorine using the methodology for deriving criteria for non-carcinogens explained in the preamble. While ADEQ has stated that it will use Safe Drinking Water Act maximum contaminant levels where they are available as water quality criteria for the DWS designated use, ADEQ has not adopted maximum residual disinfectant levels as ambient water quality criteria. Moreover, ADEQ notes that the proposed MRDL is not yet effective. No change to the rules.

194. *Comment:* It is our understanding that in calculating water quality standards, ADEQ employs the average weight of the human male, which is approximately 154 pounds. This standard is inadequate for a number of reasons. Primarily, children are most susceptible to water-borne illnesses. Using the average male to define water quality standards ensures that some standards will be too low to protect children from illness when they come into contact with the water. We suggest that ADEQ re-evaluate the average male standard, and develop a child-based standard that would afford maximum protection from water-borne illnesses.

Response: ADEQ disagrees. The 70 kg. body weight assumption used to derive the human health criteria in the surface water quality standards rules is consistent with EPA's 1980 Ambient Water Quality Criteria National Guidelines. The 70 kg. is still EPA's agency-wide adult body weight assumption used in its risk assessments and approximates the average adult body weight of 71.8 kg. from an analysis of the National Health and Nutrition Examination Survey. In its current guidance, EPA recommends several default body weight factors depending on whether chronic effects or acute effects are being evaluated. For chemicals that cause chronic effects, EPA recommends using a default body weight of 70 kilograms. Furthermore, the EPA Exposure Factors Handbook acknowledges that the 70 kg. value is commonly used in EPA risk assessments and it specifically cautions against the use of values other than 70 kg. Specifically, the point is made that the 70 kg. value is used in the derivation of cancer slope factors and unit risks that appear in the Integrated Risk Information System which ADEQ uses to obtain data to derive human health criteria. EPA advocates consistency between the dose-response relationships and exposure factors assumed.

EPA's most recent guidance on derivation of human health criteria states that in certain development effects exposure scenarios, pregnant women may represent a more appropriate target population for consideration when setting water quality criteria than all adults in cases where developmental effects are the primary concern (e.g., mercury). Likewise, for some contaminants reference doses (RfDs) based on health effects in children may be of primary concern. To protect children against health effects from water and fish intake when RfDs are based on health effects in children, EPA recommends a default body weight of 28 kg., which represents a mean body weight for children 0 to 14 years old. However, EPA recommends using the children's body weight assumption for pollutants for which adverse effects for children are the most critical endpoint in the pollutant's toxicological profile. EPA does not recommend applying a children's body weight assumption across the board to derive criteria for all priority pollutants. Moreover, EPA recommends adjusting other exposure assumptions for children along with body weight (that is, a water ingestion rate of one liter per day)

ADEQ did not propose different methodologies for developing human health criteria based on their toxicological profiles. ADEQ has not identified priority pollutants where development effects are the primary concern or where adverse effects for children are the most critical endpoint. For this reason, ADEQ did not adopt human health criteria using revised criteria derivation methodologies in the final rule. ADEQ does not necessarily disagree with the suggestion to use alternative body weight assumptions to derive human health criteria, particularly for pollutants that are of concern because of their development effects or their effects on children. Mercury is one pollutant that should be evaluated. However, ADEQ does not have the information to modify criteria in the final rules. Moreover, ADEQ believes that there should be a full public discussion of issues related to revision of the methodologies for deriving the numeric water quality criteria. No change to the rules.

195. *Comment:* We have concerns about the proposal under consideration which would repeal chronic criteria for ephemeral streams. We have questions concerning the duration of flow in ephemeral streams. We anticipate the need for chronic standards for ephemeral streams that may flow for longer periods than those protected by acute standards. Should the state repeal chronic standards for ephemeral streams, EPA would require demonstration on a case-by-case basis that flows are of sufficiently brief duration to justify application of acute standards only. It might be possible for ADEQ to provide such documentation on a categorical basis. However, ephemeral streams with longer duration flows would have to be specifically excluded from such a categorical demonstration and chronic standards for these waters would be retained.

Response: ADEQ included definitions of both "ephemeral water" and "intermittent surface water" in the surface water quality rules. The proposed definitions address EPA's concerns regarding the duration of flow in an ephemeral water. ADEQ proposes to define an ephemeral water as a surface water that has a channel that is at all times above the water table and that flows only in direct response to precipitation. In general, the flow in an ephemeral water is expected to be of short duration (that is, from several hours to several days depending upon the duration, frequency, and intensity of a storm event). By contrast, an intermittent water is defined as a surface water that flows continuously for 30 days or more at times of the year when a surface water receives water from springs or from a surface water

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source such as melting snow. ADEQ proposes to protect intermittent waters with both acute and chronic A&Wc or A&Ww criteria. The duration of continuous flow in an ephemeral water must be less than 30 days. Less than 30 days of flow is “of sufficiently brief duration” to justify acute criteria only.

ADEQ believes that the proposal to repeal chronic criteria for ephemeral waters is consistent with EPA guidance on the development of aquatic life criteria. EPA’s water quality criteria for aquatic life contain two expressions of allowable magnitude: 1) a criteria maximum concentration (CMC) to protect against acute or short-term effects and 2) a criteria continuous concentration (CCC) to protect against chronic or long-term effects. EPA derives acute aquatic life criteria from 48-hour to 96-hour tests of lethality or immobilization. EPA derives chronic criteria from longer-term tests that measure survival, growth, reproduction, or in some cases bioconcentration. According to EPA’s Technical Support Document for Water Quality-Based Toxics Control, United States Environmental Protection Agency, Office of Water, EPA / 505 / 2-90-001, PB91-127415, March, 1991 (TSD), the toxicity tests that EPA uses to establish the national aquatic life criteria for chronic toxicity are conducted using steady exposure to toxicants, usually for at least 28 days. EPA defines “chronic” in the TSD as a stimulus that lingers or continues for a relatively long period of time, often one-tenth of the life span of an organism or more. “Chronic” is considered a relative term depending on the life span of an organism. By contrast, “acute” is defined as a stimulus that rapidly induces an effect. In aquatic toxicity tests, an effect observed in 96 hours or less typically is considered acute.

In general, organisms do not have steady exposures to toxicants in ephemeral waters for the length of time it takes EPA to conduct the toxicity tests that it uses to establish the national aquatic life criteria for chronic toxicity. Long-term exposures to toxicants are not expected in ephemeral waters that flow only in direct response to precipitation events. Under the proposed definitions, an ephemeral water is a surface water that flows for less than 30 days. A surface water that flows continuously for 30 days or more is defined as an intermittent water and would be protected by chronic A&W criteria.

196. *Comment:* We note that ADEQ is considering limiting sulfide standards for lentic waters to samples taken in the epilimnion. We understand that the reasoning for this proposed revision is the temporal stratification of lakes and reservoirs which may lead to an exceedance of the sulfide standard. We have concerns about this revision as it would apply throughout the year and stratification may occur only seasonally. We recommend that the state consider other approaches, such as a seasonally applied standard that would limit monitoring of selected homogeneous portions of stratified lakes to periods of stratification and apply the mixed lake or reservoir standard the rest of the year.

Response: Because of the variability in Arizona lakes and impoundments with respect to climate, elevation, morphology, size, depth, circulation patterns, and periods of mixing ADEQ does not believe that a seasonally applied sulfide standard is practical in Arizona. No change to the rule.

197. *Comment:* We note that the proposed standards include revisions to numeric criteria for human health and aquatic life protection. We recommend that ADEQ provide thorough documentation of the data used to derive these revised criteria. In addition, ADEQ should be aware that EPA will soon make final our revised Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health. EPA encourages the state to use the revised methodology to develop or revise criteria to appropriately reflect local conditions.

Response: The state-adopted human health criteria and the methodologies for deriving the criteria are in this document. ADEQ also will provide complete documentation of the specific cancer potency slopes, reference doses, minimum risk levels, and other factors that were used to derive the criteria when the final surface water quality standards are submitted to EPA for review and approval. ADEQ is aware that new EPA guidance and revised methodologies have come out since this triennial review was initiated. ADEQ did not use any of the new criteria derivation methodologies recommended by EPA to derive the criteria contained in the final rules. However, the state-adopted criteria were developed using scientifically defensible methods and exposure assumptions that are fully explained in the rules and supporting documentation.

198. *Comment:* EPA supports the proposed tables which provide criteria for hardness-dependent and pH-dependent criteria. However, we note that the tables contain numerous values and that an error could misrepresent the applicable criterion at a given hardness or pH. EPA suggests that it be made clear in the standards that the equations are the applicable standards and that the table is provided to give the reader a convenient point of reference. As an alternative, ADEQ might wish to place these tables in a supplemental guidance document. We also note that the hardness range that was included in a footnote in the current rules have been stricken. As ADEQ is aware, the relationship between hardness and toxicity has only been tested in the range between 25-400 mg / L CaCO₃. We recommend that ADEQ restore this footnote to ensure that the standards do not misrepresent the allowable range of hardnesses.

Response: ADEQ agrees and retained the mathematical equations for the hardness- and pH-dependent parameters in the rules. ADEQ included a footnote which explains that the tables with the calculated criteria are presented for the convenience of users of the surface water quality standards. Moreover, the tables clearly state the allowable range of hardnesses is between 25- 400 mg / L CaCO₃.

199. *Comment:* ADEQ should be aware that EPA published the Revised Methodology for Deriving Health-Based Ambient Water Quality Criteria in November, 2000. This updated methodology incorporates an improved approach in derivation of water quality criteria to protect human health using significant scientific advances made during the

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past 20 years in the key areas of cancer and noncancer assessments, exposure assessments, and bioaccumulation in fish. EPA encourages the state to revise human health criteria following this updated methodology.

Response: ADEQ is aware of recent EPA guidance on the derivation of ambient water quality criteria to protect human health. ADEQ reviewed EPA's updated methodologies but chose not to revise its criteria in this triennial review because of the numerous and significant data gaps that prevent the use of EPA's revised methodologies. ADEQ believes that its criteria are based on sound scientific rationale and that they contain sufficient parameters to protect designated uses. No change to the rules.

200. *Comment:* EPA is concerned about the ADEQ proposal to modify its approach in derivation of the full and partial-body contact designated use criteria. The proposed approach which rejects the incidental water ingestion rate previously considered defensible by the state, results in criteria that become less stringent by an order of magnitude. ADEQ should provide EPA a more thorough analysis to justify the reduced protection for human health exposure in Arizona's waters. If the state's intention is to accept a higher risk level, this should be made clear to the public.

Response: The state's revision of criteria for the partial-body contact designated use are not premised on accepting a higher risk level. ADEQ is proposing to use a methodology that is acceptable for deriving water quality for the full-body contact recreation designated use and applying that methodology to derive criteria for the partial-body contact designated use. As explained in the preamble, the rejection of an overly conservative incidental ingestion rate for partial-body contact recreation that is 10 times higher than the incidental ingestion rate used to derive criteria for the full-body contact designated use is completely justifiable. ADEQ is using the same incidental ingestion rate for both FBC and PBC. The revised criteria for the partial-body contact designated use (that have been derived using a FBC methodology) are adequately protective of human health for the PBC designated use. If anything, they are over protective. In closing, ADEQ would like to point out that EPA has not recommended national criteria under § 304(a) for the partial-body contact recreation designated use.

201. *Comment:* For reasons expressed in the preamble to the Notice of Proposed Rulemaking, Asarco supports the proposal to eliminate the chronic criteria applicable to the aquatic and wildlife (ephemeral) use. Chronic criteria presuppose long term exposure of organisms and often are based on lengthy toxicity tests that would take longer to conduct than the period in which water typically flows in an ephemeral stream. For both these reasons, chronic criteria are not appropriate in ephemeral streams. To the extent organisms rely on the water in ephemeral streams, acute criteria are adequately protective.

Response: ADEQ agrees.

202. *Comment:* Asarco supports the tailoring of criteria to recognize conditions occurring during storm events in Arizona. Asarco supports additional future analysis of this issue, including formation of a stakeholder group. The ADEQ proposal contains several instances of standards being tailored to reflect the significant changes in waters that naturally result during storm events in an arid environment. For example, ADEQ proposes that some criteria will not apply in the aftermath of a storm event (e.g., the proposed suspended sediment standard and the standard for a change in temperature due to a discharge). Asarco supports these proposals and would like to see further consideration of these issues in the next triennial review. We support development of a stakeholder group to discuss the development of appropriate standards to apply during and in the immediate aftermath of storm events, particularly in ephemeral waters.

Response: ADEQ supports the formation of a stakeholder group to consider issues related to wet weather standards, the applicability of surface water quality standards to storm water discharges, and appropriate revisions to the surface water quality standards that apply to ephemeral waters.

203. *Comment:* Asarco supports the proposed changes to the PBC criteria development methodology. Developing PBC criteria based on exposure assumptions that are more stringent than those widely used assumptions that were used to develop FBC criteria does not make sense.

Response: ADEQ agrees.

204. *Comment:* ADEQ correctly notes that the most recent EPA regional data on fish consumption rates does not support changing the current default ingestion rate of 6.5 grams per day. Although higher consumption rates do exist elsewhere in the country, the data do not support using a higher assumed ingestion rate in Arizona. Unless and until such data become available, the current ingestion rate should not be changed.

Response: ADEQ agrees. The preamble discusses ADEQ's reasons for using the 6.5 grams per day fish consumption rate in detail.

205. *Comment:* Asarco supports the inclusion of the tables setting forth criteria at various hardnesses for those parameters whose criteria are set as hardness-dependent equations. However, we believe that these equations should be left in the rules as footnotes to Table 1, where they are currently located as the governing standards, since they express the relationship between hardness and the criteria. The tables should be included as illustrative only, and the rule or preamble should make clear that if there is any discrepancy, the value derived from the equation controls. It is possible that some of the numerous values in the tables are incorrect, or will be inadvertently changed during the publication process.

Response: ADEQ agrees. ADEQ included all of the pH- and hardness-dependent equations in the surface water quality standards rules and the tables with the calculated criteria. ADEQ added a footnote to the rules which clarifies that the mathematical equations express the controlling water quality standards and the tables for the hardness-dependent and pH-dependent parameters are provided for the convenience of users of the surface water quality standards rules.

Appendix B. List of Surface Waters and Designated Uses

206. *Comment:* We question whether using the 5000 foot cutoff for A&Wc and A&Ww is appropriate and that either a lower elevation or additional factors should be considered.

Response: ADEQ believes that the use of the 5000 foot elevation contour to designate the A&Wc and A&Ww is appropriate and scientifically defensible. See response to previous comment on designated uses.

207. *Comment:* To simplify the standards and to promote better understanding of the rule and better water quality overall, we suggest designating all of Arizona's surface water for full-body contact recreation use and to just eliminate the partial-body contact designated use and standards, unless it is clear that children do not have access to the area. There is almost no difference between partial-body contact and full-body contact when it comes to children, we think the most protective standards possible should apply to all of these surface waters in order to adequately protect the health of young children. It is not only possible that an individual may incidentally ingest some amount of water when he or she swims in surface water; it is likely, especially if that person is a young child. We would like to see ADEQ build in some kind of safety factor in determining these limits and would rather see it default to more protective standards. Unfortunately most of the standards are established based on the average weight of the human male.

Response: The state has recognized a distinction between the water quality standards for primary recreation (full-body contact) and secondary recreation (partial-body contact) since the first adoption of water quality standards for streams in Arizona in 1968. ADEQ agrees with the commenter that a single recreation use would simplify the surface water quality standards rules. ADEQ also agrees that with the adoption of the new *E. coli* criteria and a revised methodology to derive water quality criteria for the PBC designated use in this triennial review, there are only a few differences in the water quality criteria that have been established for the FBC and PBC designated uses. The lack of significant differences between the water quality standards for the FBC and PBC designated uses lends support to the argument that the two designated uses should be combined. However, the elimination of the partial-body contact recreation designated use would be a significant change from the proposed rules and cannot be made at this stage of the rulemaking. ADEQ would have to terminate this rulemaking and re-propose the surface water quality standards rules. The suggestion to combine the two designated uses into a single recreational use has merit and should be given serious consideration. However, ADEQ believes that consideration of this issue should be deferred to the next triennial review of water quality standards. In the meantime, ADEQ believes that the water quality criteria for the partial-body contact recreation use (which are essentially the same as the criteria for full-body contact recreation) are adequately protective of persons who may engage in partial-body contact recreation activities, including children.

208. *Comment:* ADEQ appears to have correctly further subdivided the section of Mule Gulch below the Bisbee WWTP by limiting the effluent-dependent section of Mule Gulch to below the Bisbee WWTP to the Highway 80 bridge. ADEQ should ensure that it also modifies the effluent-dependent description for Mule Gulch in R18-11-113(D)(4)(a) consistent with the change in Appendix B.

Response: Appendix B and R18-11-113(D)(4)(a) are revised to include the proper description of the EDW reach below the Bisbee WWTP.

209. *Comment:* ADEQ has recognized that the partial-body contact (PBC) designated use for Mule Gulch from its headwaters to the Bisbee WWTP is appropriate because this segment of Mule Gulch is most likely ephemeral. Consistent with ADEQ's recognition of Mule Gulch's primarily ephemeral status, ADEQ has proposed dividing Mule Gulch from the headwaters to the Bisbee WWTP into two segments with the upper segment from the headwaters to just above the Lavender Pit having the designated uses of A&Ww, PBC and FC and the lower segment from Lavender Pit to the Bisbee WWTP, which is clearly an ephemeral segment, having the designated uses of A&We and PBC. Phelps Dodge agrees with these revisions with the exception that Phelps Dodge believes that the FC designated use for the upper segment of Mule Gulch to just above Lavender Pit should be deleted. Fish consumption clearly is not an attainable use anywhere in Mule Gulch.

Response: The establishment of the fish consumption (FC) designated use for the upper segment of Mule Gulch from its headwaters to the Lavender Pit is consistent with the § 101(a)(2) goals of the Clean Water Act. In the absence of information to justify omission of the FC designated use or to support a use attainability analysis, ADEQ will establish the FC designated use for the upper reach of Mule Gulch.

210. *Comment:* ADEQ is considering a proposal to revise the EDW segment of Queen Creek to an ephemeral water. This modification, in concert with the proposal to repeal chronic standards from ephemeral streams, would remove such standards from the reach of Queen Creek from the Superior Mining Division discharge to the Town of Superior WWTP. As with any use modification, ADEQ must provide a UAA based upon factors outlined at 40 CFR § 131.10(g)(1-6). In addition, upstream discharges to the newly defined ephemeral reach would be required to be protective of the downstream EDW reach. We understand, based on ADEQ's May 16, 2001 letter that the proposed modification of the designated use of this segment was based on information provided by BHP Copper. However, ADEQ

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has not submitted this information and the analyses employed to reach findings to EPA. We reiterate the need for ADEQ's UAA submission for EPA review and approval.

Response: ADEQ will submit supporting documentation to EPA to support the revision of the EDW segment of Queen Creek from the Superior Mining Division discharge to the Town of Superior WWTP to an ephemeral water. ADEQ will submit that documentation when the water quality standards are submitted to EPA Region IX for review. The UAA to support this change is based on 40 CFR § 131.10(g)(2). That is, "natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use..."

211. *Comment:* The portion of Queen Creek from Potts Canyon to El Camino Viejo Road was listed as having a warm water fishery designation. The proposed rule merely changes the designation to aquatic and wildlife (warm water). This designation is incorrect. In April, 1997, the Queen Valley Sanitary District wrote to ADEQ stating that the section of Queen Creek west of the Queen Valley golf course should be changed. On June 2, 1997, the Department wrote back the following reply:

The dry wash that the wastewater treatment plant discharges into has been designated as an effluent-dependent water [R18-11-113(D)(h)(3)]. In addition, the Department agrees that where Queen Creek and the dry wash meet, Queen Creek is an ephemeral stream. Field notes show that in January, 1995, ADEQ staff investigating the lower portion of Queen Creek found "the channel just above El Camino Viejo Road / Queen Creek Bridge was devoid of surface flow even though the two weeks prior had been typified by scattered heavy rains." The issue has been referred to the Water Quality Standards Unit to clarify during the next triennial review process. (ca 1999 or 2000).

The section between Potts Canyon and the Whitlow Dam and a short distance downstream where irrigation water is released from the dam is most likely designated warm water aquatic and wildlife. However, once the creek gets beyond the Queen Valley Golf Course, it is ephemeral and should not be designated warm water aquatic and wildlife. Likewise, agricultural livestock watering is impossible. Please change the designation of Queen Creek beyond the golf course to its proper designation.

Response: ADEQ changed the description of Queen Creek from "Potts Canyon to El Camino Viejo Road" to "Potts Canyon to Queen Valley Golf Course." ADEQ retained the aquatic and wildlife (warm water) designated use for this reach of Queen Creek. ADEQ changed the description of Queen Creek from "[b]elow El Camino Viejo Road" to "below Queen Valley Golf Course" and retained the aquatic and wildlife (ephemeral) designated use for this lower segment of the Queen Creek.

212. *Comment:* We note that the domestic water source use for the Colorado River is only designated to the Imperial Dam. Since drinking water is drawn downstream in Mexico, DWS is an existing use. We recommend that ADEQ extend the DWS use designation to Morelos Dam. In ADEQ correspondence to EPA, ADEQ states that the lower Colorado River below Imperial Dam is not used as a drinking water source in Arizona. We encourage ADEQ to consider the protection of downstream uses in the establishment of standards. The absence of the drinking water use within the state does not protect downstream uses. Additionally, no demonstration has been provided by Arizona concerning the absence of the drinking water use in the reach between Imperial and Morelos Dam.

Response: First, it should be noted that the domestic water source designated use is not one of the uses specified in § 101(a)(2) of the Clean Water Act that must be designated under the Clean Water Act. Because DWS is not a use specified in § 101(a)(2), ADEQ is not required to justify its omission for the Lower Colorado River. ADEQ has no information to support EPA's assertion that the lower Colorado River below Imperial Dam is used as a source of drinking water. To the best of ADEQ's knowledge, the lower Colorado River below Imperial Dam is not used as a drinking water source. The City of Yuma obtains its drinking water supply from the All-American Canal. Surface water is diverted into the All-American Canal at the Imperial Dam and then into a siphon which goes under the lower Colorado River into the canal system that provides surface water to the City of Yuma drinking water treatment plant.

ADEQ is unaware of any provision in the Clean Water Act or the federal water quality standards regulations that requires Arizona to establish designated uses that are not specified in § 101(a)(2) or to justify their omission. Each state has discretion to specify appropriate designated uses to be achieved and protected in its surface waters. ADEQ recognizes that it must take into consideration the water quality standards of downstream waters and ensure that its state-adopted standards provide for the attainment of the water quality standards of downstream waters. However, ADEQ is not sure how this requirement applies to international waters. In the past, ADEQ has not considered uses of surface waters that flow into Mexico when establishing designated uses for surface waters in Arizona. However, because the lower Colorado River may be used as a source of drinking water in Mexico, ADEQ established the DWS designated use.

213. *Comment:* We note that there are a number of newly listed or revised uses for waters included in Appendix B. For those waters that do not have uses consistent with § 101(a)(2) of the Clean Water Act, the state must submit UAAs as described at 40 CFR § 131.10(g).

Response: ADEQ agrees that it must conduct a use attainability analysis when it designates uses for a surface water that do not include the uses specified in § 101(a)(2) of the Clean Water Act. ADEQ is not required to submit UAAs to support revisions of designated uses that are consistent with "fishable / swimmable" goals of the Clean Water Act. Most of the revisions that have been made in Appendix B do not need to be supported by UAAs.

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214. *Comment:* We note that the proposed standards lists Havasu Canyon Creek downstream of the Havasupai Reservation in the list of surface waters and designated uses in Appendix B. Havasu Canyon Creek is designated with the A&Ww use. We understand that populations of non-native trout are established in this reach of Havasu Canyon Creek. In the absence of information to support the designation of the A&Ww use, we would require the state to designate a beneficial use protected by appropriate water quality criteria consistent with 40 CFR § 131.6(c). ADEQ may wish to discuss this matter with the USFWS in light of management considerations for the federally-listed endangered humpback chub.

Response: The lower portion of Havasu Creek is appropriately designated with the A&Ww designated use because it is below the 5000 foot elevation contour. Also, the Havasupai Tribe submitted written comments in support of the A&W(w) designated use for Havasu Creek. In written comments to the state's preliminary draft of the surface water quality standards, the Tribe stated that it was developing water quality standards for Havasu Creek. The Tribe proposed to establish A&Ww for all of Havasu Creek stating that water temperatures in the creek typically run around 20°C near the village of Supai and reach over 25° C at the confluence with the Colorado River. The Tribe also stated that Havasu Creek is one of the few tributary streams available for recovery efforts for the humpback chub. Moreover, the Tribe stated that natural barriers prevent trout migration into Havasu Creek from the Colorado River. The Havasupai Tribe concluded in their comments that water temperatures of the creek closely fit definitions for a warm water aquatic habitat and that any trout found in the lower reaches of Havasu Creek were residing in very marginal temperature conditions for growth, recruitment, and survival. For all of these reasons, ADEQ adopted the A&Ww designated use for Havasu Creek.

215. *Comment:* The preamble to the proposed rulemaking indicates that fish consumption is not an existing use in the canals that are listed in the surface water standards. Reports indicate that fishing occurs in various canals in Arizona. Accordingly, we request that ADEQ confirm that fishing is not an existing use in the canals listed in its water quality standards.

Response: For the reasons stated in the preamble to the final rule, ADEQ will not establish the fish consumption designated use for the canals listed in the surface water quality standards. ADEQ requests clarification regarding the documentation that would be required by EPA to confirm that fishing is not an existing use. How can the state make that demonstration?

216. *Comment:* Asarco supports classifying as ephemeral the upper portion of Alum Gulch, all of Harshaw Creek, and the upper portion of Sonoita Creek. The ephemeral classification accurately reflects the condition of these waters, as documented by ADEQ during its attempts to obtain data as part of the TMDL development process in this region.

Response: ADEQ agrees. Harshaw Creek and the upper portions of Alum Gulch and Sonoita Creek have the A&W (ephemeral) designated use in the final rule.

217. *Comment:* Pima Association of Governments (PAG) prepared a report in January, 2000 that identified perennial and intermittent streams in eastern Pima County. Based on the information we obtained during that investigation we would like to propose the following changes in the Santa Cruz River and the San Pedro River basins sections of Appendix B:

1. Davidson Canyon: Where the ephemeral reach location is described as "below confluence with unnamed tributary" it should be changed to read: "From confluence with unnamed tributary to unnamed spring at 32° 00' 54" / 110° 38' 54." There should be a new segment for Davidson Canyon with the following location: "From unnamed spring at 32° 00' 54" / 110° 38' 54" to confluence with Cienega Creek." The new segment should have the A&Ww designated use.

2. Agua Caliente Wash: Review of aerial imagery from the PAG Regional Dataset (1998) showed evidence of stream flow and wet soil within the channel that extended just downstream of Soldiers Trail indicating this portion of Agua Caliente Wash has intermittent flow. Therefore, where the location is listed as "Below the Coronado Forest Boundary" a change should be made so that it reads "Headwaters to Soldier Trail" with a use designation of A&Ww. A new segment should be added for Agua Caliente Wash with a location as follows: "Below Soldier Trail" with a designation of A&We.

3. Empire Gulch: Empire Gulch has been determined to have perennial reaches based on surveys conducted by BLM. BLM staff documented the two reaches that were determined to have perennial flow. They have described one reach having an upstream location of 19S, 17E 10NE SW to a downstream location of 19S 17E 03 SE NE. The other reach has an upstream location of 19S 17E 18NW NW to a downstream location of 19S 17E 17NW NW. In Appendix B, the segment from the "headwaters to an unnamed spring" is listed as A&We. This should be changed to read "headwaters to 31°47'14" / 110°38'13". A new segment should be added for the perennial portion of Empire Gulch with a location description as follows: "From 31°47'14" / 110°38'13" beyond unnamed spring to 31°47'11" / 110°00'39". The designation should be A&Ww. The segment location that reads "Below unnamed spring" should be changed to read "Below 31°47'11" / 110°39'00" to 31°47'18" / 110°36'57" with a designation of A&We. A new segment should be added for the other perennial reach: "From 31°47'18" / 110°36'57" to confluence with Cienega Creek with a designation of A&Ww.

4. Santa Cruz River: The effluent dominated flow begins at Nogales WWTP and based on observations made by Pima County staff, the location of the end of flow is at Elephant Head Road. The Santa Cruz River (EDW) segment,

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the location information should be changed to read, “Nogales International WWTP to Elephant Head Road.” The next segment location should read “From Elephant Head Road to the Roger Road WWTP” instead of “Tubac Bridge.”

5. Sutherland Wash: Sutherland Wash has intermittent flow. The location should read “from near the headwaters to the confluence of Canada del Oro” and should be designated as A&Ww.

6. Tanque Verde Creek: Tanque Verde Creek is both intermittent and has perennial flow. The location description for Tanque Verde Creek should be changed to the following: “Headwaters to near Houghton Road at 32°14’13” / 110°46’04” and should be designated as A&Ww. The other Tanque Verde Creek segment should then read “Below Houghton Road” and be designated A&We.

7. Sycamore Canyon: Sycamore Canyon has been determined to have intermittent flow. A segment should be added with the following location: From 32°21’36” / 110°45’21” to Sycamore Reservoir, A&Ww. It is likely that the intermittent flow begins near the headwaters and would be designated as an A&Wc use for the portion above 5000 feet. Sycamore Reservoir’s designation should be changed to A&Ww as it is at an elevation less than 5000 feet.

In the text of the rule the location descriptions for Cienega Creek and for Buehman Canyon in R18-11-112 were found to be inconsistent with the descriptions used in Appendix B.

Response: ADEQ made the all of the above changes to Appendix B except the changes to the Santa Cruz River mentioned in Paragraph 6. It is not clear how the effluent-dependent reach of the Santa Cruz River should be described because of the pendency of a request for the establishment of a new EDW section of the Santa Cruz River below Green Valley. ADEQ retained the current descriptions in Appendix B and will defer revisions to the descriptions of the effluent-dependent reaches of the Santa Cruz River to a future rulemaking. ADEQ checked the location descriptions for Cienega Creek and Buehman Canyon in R18-11-112. While the descriptions are not identical, they are not inconsistent with each other.

218. *Comment:* The following streams in Pima County have been found to have perennial flow and are currently not listed in Appendix B of the surface water quality standards rules: Apache Spring, Cinco Canyon, Edgar Canyon, Honey Bee Canyon, Little Nogales Spring, Nogales Spring, Posta Quemada, Quitobaquito Springs, Scholefield Spring, Simpson Spring, and Wild Cow Spring. We have enclosed documentation from our January, 2000 report and copies of topographic maps indicating the areas of perennial flow.

Response: ADEQ did not add the listed perennial streams to Appendix B of the surface water quality standards rules for the following reasons. First, the large majority of the listed streams are very small reaches that are associated with springs. In general, ADEQ has not listed small springs and their associated reaches in Appendix B. ADEQ has relied on the operation of the tributary rule to assign water quality standards to these surface waters. Second, for many of the listed springs, the documentation of perennial flow was based on a document by the Sonoran Institute. However, the Sonoran Institute documentation was not provided to ADEQ. Third, for several of the springs, the documentation of stream flow, the length of the perennial reach, or other descriptive information was unavailable (for example, Apache Spring, Wildcow Spring, and Scholefield Spring). Finally, no information was provided to ADEQ on what the designated uses of the listed surface waters should be. For all of these reasons, ADEQ decided not to list the springs in Appendix B in this triennial review. It should be noted that one of the surface waters, Quitobaquito Springs, is already listed in Appendix B in the Rios de Mexico basin.

219. *Comment:* Carlota believes that the naming of a segment of Pinto Creek upstream of 33°50’30” / 110°53’13” as A&Wc may be incorrect. All of Pinto Creek should be A&Ww. About a mile upstream from this location is the old Simpson Dam. This structure has been partially breached but it still possibly influences Pinto Creek immediately downstream.

Response: ADEQ disagrees that all of Pinto Creek should be designated as A&Ww. ADEQ designated the segment of Pinto Creek above 33°50’30” / 110°53’13” as A&Wc using the 5000 foot elevation contour as a predictive model for aquatic life use designation for intermittent and perennial streams. While ADEQ recognizes that there are exceptions to the use of this general decision principle to establish the A&Wc and A&Ww designated uses, Carlota did not provide enough information to support establishment of the A&Ww designated use for the segment of Pinto Creek that is upstream of 33°50’30” / 110°53’13”.

220. *Comment:* ADEQ should amend the water quality standards language to add language that specifically recognizes its ability to adopt site-specific water quality standards for any type of water body. Site-specific water quality standards may be appropriate in several instances including situations where pollutant loadings from naturally occurring conditions alone are sufficient to cause a violation of applicable surface water quality standards as well as situations where scientific data demonstrate that the current water quality standards are more stringent than necessary to protect aquatic life in a water body. The current version of the standards specifically authorizes ADEQ to adopt site-specific standards for unique and effluent-dependent waters. Because the standards only address the development of site-specific standards in relation to unique and effluent-dependent waters, the current rule language could be interpreted to mean that the establishment of site-specific standards is limited to such waters. This potential interpretation of the standards should be clarified.

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Response: ADEQ agrees that it has the authority to adopt site-specific standards for all surface waters. However, cannot adopt a rule clarifying its authority to adopt site-specific standards without re-noticing the rule in a new Notice of Proposed Rulemaking. Consideration of this issue should be deferred to the next triennial review.

221. *Comment:* Asarco recommends that the rule be modified to recognize ADEQ's ability to establish site-specific standards in a water. That authority is currently only recognized explicitly for unique waters and effluent-dependent waters. Referencing the ability of ADEQ to develop site-specific standards in these two contexts but not more generally, arguably could be interpreted to mean that ADEQ's ability to set site-specific standards exists only in these situations and not more generally. Asarco recommends that language be added to R18-11-109 to allow ADEQ to establish site-specific standards.

Response: ADEQ agrees that it has the authority to adopt site-specific standards for all surface waters even though site-specific standards are specifically mentioned only in the unique waters and effluent-dependent waters rules. However, ADEQ did not propose a rule that addresses site-specific standards generally. ADEQ cannot adopt a new rule in a Notice of Final Rulemaking addressing site specific standards without terminating the rulemaking and re-proposing.

Section 7 consultation

222. *Comment:* The new revisions that are pertinent to Endangered Species Act concerns are the proposed antidegradation implementation guidance, the mixing zone rule, and the variance rule. Information provided here does not preclude the need for § 7 consultation with the Environmental Protection Agency under the ESA.

Response: ADEQ understands that EPA review and approval of the surface water quality standards is a federal action that is subject to § 7 consultation under the Endangered Species Act.

EPA Review of State-Adopted Water Quality Standards

223. *Comment:* Please note that EPA Region IX recently transmitted a letter to all states concerning minimum submission requirements. This letter described and clarified EPA expectations regarding supporting documentation required for EPA review of submitted standards as outlined in 40 CFR § 131.6. ADEQ should be aware that EPA review of state-adopted standards cannot commence without such documentation.

Response: ADEQ understands that EPA review of state-adopted water quality standards is governed by

40 CFR § 131.6. 40 CFR § 131.6 requires that the following elements be included in Arizona's water quality standards that are submitted to EPA for review: 1) Use designations that are consistent with the provisions of § 101(a)(2) and § 303(c)(2) of the Clean Water Act [33 U.S.C. § 1251(a)(2) and § 1313(c)(2)], 2) Methods used and analyses conducted to support water quality standards revisions, 3) water quality criteria sufficient to protect the designated uses, 4) an antidegradation policy consistent with 40 CFR § 131.12, 5) certification by the Arizona Attorney General or other appropriate legal authority within the state that the water quality standards were duly adopted under state law, 6) general information that will aid EPA in determining the adequacy of the scientific basis of the standards that do not include the uses specified in § 101(a)(2) of the Clean Water Act, and 7) information on general policies applicable to the state water quality standards that may affect their application and implementation. ADEQ is aware of these requirements and recent EPA guidance on water quality standards submissions to EPA. ADEQ understands that EPA review of the state-adopted water quality standards will not commence until a complete water quality submission is made to EPA Region IX.

224. *Comment:* As ADEQ knows, EPA revised its regulations at 40 CFR § 131.21 to clarify that standards are only available for implementation under Clean Water Act authorities following EPA approval. EPA recommends that the state rules reflect that the standards do not become effective under federal authority until EPA has completed its review and approval under 40 CFR § 131.21 and § 303(c) of the Clean Water Act.

Response: ADEQ disagrees that the state rules should include a specific statement that the water quality standards do not become effective for Clean Water Act purposes until EPA has completed its review and approved the standards under § 303(c) of the Act and 40 CFR § 131.21. While ADEQ agrees that EPA's comment correctly states the current law after the Alaska Clean Water Alliance v. Clark, No. C96-1762R (W.D. Wash. July 8, 1997) decision, ADEQ believes that this implementation issue should not be addressed in the rules for several reasons. First, 40 CFR § 131.21 clearly addresses the issue of EPA approval in the federal water quality standards regulations. Second, a specific statement in the state surface water quality standards rules may result in confusion over which surface water quality standards are EPA-approved and effective and which standards are under review and are not effective for Clean Water Act purposes.

Other Issues

225. *Comment:* The Service wishes to mention the recent work on the effects of hormones in wastewater treatment plant discharges to fish in the receiving waters. Hormones are not currently a measured component of the discharge under an NPDES permit. As more information becomes available on this topic, the potential for adverse reproductive effects to listed species in the protected waters of the state from these hormones will require additional study. If there are adverse effects, additional consultation on WWTP discharges may necessary.

Response: While ADEQ is aware of recent research on new pollutants that may have an adverse affect on aquatic life (e.g., endocrine disrupters, pharmaceuticals), ADEQ does not have enough data to propose numeric water quality criteria. ADEQ agrees that these types of pollutants merit additional study.

226. *Comment:* EPA has suspended its regulatory effort to address total maximum daily loads. Since these regulations are driven, at least in part, by that federal regulatory event, ADEQ should consider postponing the related regulatory changes until there is a better signal from the federal government about how this subject is going to be treated.

Response: ADEQ cannot postpone the triennial review of surface water quality standards because EPA has withdrawn proposed federal rules addressing total maximum daily loads. The triennial review is driven by requirements prescribed in § 303 of the Clean Water Act, not the federal TMDL rulemaking.

227. *Comment:* The recent discussions regarding the TMDL rule have highlighted the importance of collecting data (especially data to be used for compliance or enforcement purposes) under appropriate quality assurance and quality control protocols, and pursuant to a sampling and analysis plan. Asarco suggests that concepts or language similar to that being considered for the TMDL rule (e.g., that samples be collected by someone who has the appropriate training) be included as part of the surface water quality standards program.

Response: ADEQ disagrees with the suggestion that it develop rules to regulate the internal operations of the Surface Water Monitoring Unit and the implementation of the ambient surface water quality monitoring program. ADEQ already implements its surface water monitoring program under an agency-wide Quality Management Plan and a program-specific quality assurance program plan. SWMSU staff collect surface water quality data pursuant to sampling and analysis plans that are prepared each water year.

12. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

Not applicable

13. Incorporations by reference and their location in the rules:

In R18-11-110(B): "1999 Review, Water Quality Standards for Salinity, Colorado River System." Colorado River Basin Salinity Control Forum, 106 West 500 South, Suite 101, Bountiful, Utah 84010-6232 (June, 1999), which is incorporated by reference and on file with the Office of the Secretary of State and the Department. This incorporation by reference contains no future editions or amendments.

In R18-11-112(D)(4): "Endangered and Threatened Wildlife and Plants," 50 CFR § 17.11 and § 17.12 (revised as of October 1, 2000) which is incorporated by reference and on file with the Department and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.

14. Was this rule previously adopted as an emergency rule?

No

15. The full text of the rules follows:

(See Part 2 of this issue of the Register for the text of the rules.)